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HISTORY OF THE AMERICAN PHARMACEUTICAL ASSOCIATION. SECOND DECADE.

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(Continued from December Number.)

When the Association convened for its sixteenth meeting in 1867 at Philadelphia, President Milhau was unable to attend owing to ill health and the First Vice-President, Robert J. Brown, therefore presided the first half of the meeting. There were one hundred and thirty-four members present, the first time that one hundred was exceeded. One of the members of the Association who had died during the preceeding year, was Henry F. Fish, of Connecticut, who had been present at the first annual meeting, who came from his interest in the new Association without having been delegated by any local association or college. He was Third Vice-President in 1855.

The President's address was note-worthy for its many recommendations, nearly all of them affecting the usefulness of the Association and methods for expediting transaction of business. These recommendations were afterwards taken up and caused much debate and exchange of opinion, in which old and new members of the Association participated. At the close of his address, Mr. Milhau made these pertinent remarks:

"I would address you according to my convictions on the true plan, to use the words of the Constitution, 'Of improving the science and art of pharmacy, of regulating the system of apprenticeship, and of suppressing empiricism' with any degree of success—and that is by professional instruction. It will require the whole influence of every member to further the plan proposed or a better one. It will take a long time and require hard work. We must commence by organizing our forces. It would be necessary to appoint 'a central committee on laws and colleges,' and all the members in each state should band themselves together and constitute 'sub-committees' for their respective states. The general committee should publish a full collection of all the existing state laws bearing on the subject, together with comments, followed by an account of kindred laws in Great Britain, especially those lately enacted. They will issue instructions as far as necessary, and drafts of the proposed laws for

the use of the sub-committees. Every member should, by explanation and by all proper arguments, endeavor to enlist the influence of every prominent citizen he can reach,—the state representatives, the ministers, the lawyers, the physicians, his customers, and the editors—so as to bring the legislature and executive of each state over to our views, and never cease, till we have obtained the requisite laws, and founded a college of pharmacy in each state. It was by such means that we succeeded in obtaining the drug law of 1848, when the country was much less prepared for such a step than now."

He also makes a plea for the official recognition of pharmaceutical colleges and hopes that the time will come soon when a diploma or certificate will be a *sine qua non*. Such a statement from a man who was generally supposed to be a representative of the business part of pharmacy and at such an early date deserves recognition.

Among the delegates there were two from Canada, and Mr. Stearns took occasion to welcome them and offered the following resolution:

"*Resolved*, That the American Pharmaceutical Association welcomes heartily the presence at this meeting of the delegates from the Montreal Chemists' Association—the first one credited to us from the Dominion of Canada."

The two delegates, Mr. Mercer and Mr. Edwards, replied in a happy and pleasing manner.

Among the new officers elected at this meeting, there were Edward Parrish of Philadelphia, for President; Albert E. Ebert of Chicago, one of the Vice-Presidents; and Dr. Frederick Hoffman of New York, Chairman of the Committee on the Progress of Pharmacy. This last election was certainly a high tribute paid to Dr. Hoffman, who had only joined the Association at that meeting.

The question of incorporation again caused a long debate in which all the leading men participated and it is remarkable how nearly every one opposed it. Mr. Procter says: "My own view is in opposition to such a course. I do not approve of it." Mr. Stearns says: "You could not get it if you wanted it." Mr. Bedford says: "My views are the same." Prof. Moore says: "I don't see any practical advantage in incorporation." No action was taken.

A long, and sometimes heated, debate took place when the second letter from the East River Medical Association was read with reference to the renewal of prescriptions. Those who are interested in the various views as to the proprietorship of prescriptions and the proper attitude of pharmacists to take, so as to do justice to physicians, as well as to the public should not fail to read these discussions which took up more than twelve pages in very small type and thoroly exhaust the subject. The matter was finally referred to a Committee of five, with Mr. Stearns as Chairman, who at a later session offered the following resolution, which was adopted by unanimous vote. While the question itself was not settled thereby, it is well worth while to reproduce this resolution, so as to show the opinion of the Association on this question forty years ago.

"WHEREAS, The East River Medical Association of New York, through its Secretary, has submitted a preamble and series of resolutions regarding the renewal of physicians' prescription without the authority for such renewals, for our consideration, and

"WHEREAS, The discussion of this important subject has called forth a free expression of opinion from our members; therefore be it

"*Resolved*, That this Association regard the pharmacist as the proper custodian and owner of the physicians' prescriptions once dispensed.

"*Resolved*, That however desirous we may be to accede to the request of the East River Medical Association, the restriction of the pharmacist to a single dispensing of a prescription, without the written authority of the prescribing physician for its renewal is neither practicable nor within the province of the Association. Nevertheless we regard the indiscriminate

renewal of prescriptions, especially when intended for the use of others than those for whom they were prescribed, as neither just to the physician nor to the patient, between whom we stand as conservators of the interests of both, and that such abuses should be discouraged by all proper means."

The recommendation of the President to have a committee appointed to collect formulas for un-official preparations, also brought out many diverging opinions, but finally such a committee was appointed. The question of a rather political nature that agitated this country ever since, was that of duties on drugs, and it seems that the members of the Association at that time were not impressed particularly with the value of high tariff, for "on motion of the Business Committee, it was resolved, that in the opinion of the Association the duties on drugs ought to be reduced."

Query 16, presented at the sixteenth meeting, namely, "How far is Pharmacy entitled to rank as a Profession, and what is its true position among the industrial pursuits?" had been left for general acceptance, but, not being answered, it was presented by the President for general discussion. In the course of these discussions the question of the name of "Pharmacal" and "Pharmacist" was again brought up and Mr. Parrish made the remark: "Now for these terms 'pharmacist,' etc., was it not I that read the first paper about it? I shall have to claim that invention. You will find it in the Proceedings of two years ago at Detroit—a paper proposing the general use of the term 'pharmacist' "; to which, however, the following retorts were made: Dr. Squibb said: "You can find it in Worcester's dictionary"; and Mr. Markoe said: "Webster has had it for many years."

In order to settle this claim of Mr. Parrish of the words "pharmacist," and "pharmacal," and "pharmacy," to indicate the place of business of the pharmacist, your historian has taken much pains in tracing these words, with this result: In Webster's Dictionary the word "Pharmacist" appears in the edition of 1865 for the first time, preceding edition of 1857 not having it. In Worcester's Dictionary it appears first in 1866. This shows that it was used in the United States before Mr. Parrish read his paper in 1866. In English literature it appears in Lord Bulwer Lytton's novel, "The Last Days of Pompeii," which was published in 1834. The quotation being, (part 1, pg. 11) "Unskilful pharmacists! pleasure and study are not elements to be thus mixed together." In none of these works does the word "pharmacal" appear, and the word "pharmacy" is defined as the science and art of preparing medicine. It will be seen therefore, that Mr. Parrish cannot claim priority to the word "pharmacist," but is entitled to the invention of "pharmacal" and the application of "pharmacy" to the place of business of the pharmacist.

The question whether pharmacy was a business or a profession was answered by most of them stating that it was neither, it was an art; claiming that the word "art" was more comprehensive, broader and more significant, than either of the others.

The question of a code of ethics was brought up by Mr. Maisch. A code of ethics was drafted at the preliminary meeting in 1851, which gave rise to the American Pharmaceutical Association. It was also printed in the first volume of the proceedings, but after that was omitted. Mr. Maisch asked the question

whether this code of ethics was still in force and whether new members in signing the Constitution also subscribed to this code. The matter was finally referred to a committee under the chairmanship of William J. Procter, Jr., to report at a later meeting. This committee reported that the original code of ethics was afterwards incorporated in the Constitution and that there seemed to be no necessity to continue it any longer. A motion by Mr. Allison that the code of ethics be considered as superseded by, and embodied in, Article 1 of the Constitution, was unanimously adopted.

The regret of President Milhau, that it was sometimes very difficult to obtain the proper information on the life and doings of deceased members, caused the Business Committee to bring forward the suggestion that the members of each state form a local committee to furnish the Executive Committee with proper information. It was also suggested that an obituary committee might be created. Later on another resolution bearing on this question was offered, namely:

"*Resolved*, That a committee of five be appointed by the chair to solicit photographs of members of the Association to be kept in an album, to be on exhibition at our future meetings."

It is to be regretted that the idea of making a card for every new member, on which all facts and details of his life, education, work and activities, inside and outside of the Association were to be recorded, was not established at this time. Such a cabinet of cards, embracing by this time about four to five thousand names, would be more than valuable material for the present or future historian, and would have the undisputed advantage of authenticity.

Dr. Hoffman called the attention of the Association to the fact that Professor Ehrenberg of Berlin, inventor of the microscope, was about to celebrate the fiftieth anniversary of his Doctorate, and that it would be proper for this Association to appoint a committee to prepare an address embodying the kind sentiments of the Association, to be sent to Dr. Ehrenberg on the occasion of his approaching jubilee. The Committee consisted of Dr. H. P. Procter and Mr. J. M. Maisch.

A number of honorary members, living in Europe, were appointed at this meeting, namely:

Daniel Hanbury	London, England
Henry Deane	London, England
A. T. De Meyer	Brussels, Belgium
Norbert Gille	Brussels, Belgium
Dr. F. A. Fluckiger	Berne, Switzerland
Dr. G. C. Wittstein	Munich, Germany
Dr. Frederick Mohr	Bonn, Germany
Dr. Hermann Hager	Berlin, Germany
Dr. G. Dragendorff	Dorpat, Russia
Dr. Arthur Casselmann	St. Petersburg, Russia
Mr. Robinet	Paris, France
Mr. Boullay	Paris, France

From the reports, the one on Progress of Pharmacy, written by C. Lewis Diehl, comprised one hundred and fifty-seven pages, more than one-third of the whole book. In this report, as well as in nearly all others handed in at this meeting, the word "pharmacist" is continually used in place of "pharmaceutist," but the official reading of the Constitution still adheres to the old name. The most remarkable report of the year was the report of the Committee of Drug

Market, signed by Daniel C. Robbins. It seems that Mr. Robbins was somewhat displeased with the condition of Pharmacy in the United States, and this spirit of dissatisfaction and unfavorable criticism pops out more or less in all parts of the report.

The first part again reviews the different terms and compares the words "druggist, chemist, apothecary, pharmacist and pharmaceutist" coming to the conclusion that

"the two words, 'druggist and pharmacist,' will probably come into general use, the one as the most fitting term for all dealers in druggists' articles, and the other, as the only word, unless we invent some new one, that can include a knowledge of combinations of all kinds, chemicals, and what we call compatible combination, for the want of a more precise term, the first implying a knowledge of the laws of chemical affinity, and the last, a knowledge of those controlling forces which crude material substances exert over each other in determining combinations. A good chemist may not understand pharmacy, but an accomplished pharmacist must understand chemistry, but hence while we cannot define pharmacy as we can chemistry, we must accord it a superior position, from the fact that the greater includes the less."

After deploring the want of respect for most of the professions in the United States, he makes a strong plea:

"But we must remember that it is not good for us to be forever in the chamber of suffering or always attendant on death, no constitution can endure it and no pursuit can stand it; we *must* renovate ourselves, *must* fill our empty shelves; the apothecaries *must* go out anew into life and catch the beat of its pulse forever renewed, and fill themselves with all the light of the day, take a look at the ocean of life and feel the breath of its sea.

"What we most want is a just estimate of ourselves, of our resources, of our obligations; and the true policy of the druggist and pharmacist is, to make his pursuit or his profession as useful as possible in all ways. We do not want less range, but more education, more character, because in our pursuit, more than in any other, there is a demand for character in the individual, for quality in the article, and for a better standard of morals in trade."

Mr. Robbins then goes into a classification of drugs and chemicals and favors greatly the French method in preference to the German or the English. Then comes a long record of the imports and exports of drugs of the United States, which more or less are based on the wants of the wholesaler than the retailer. He regrets that it is almost impossible to get pure drugs of any kind, and becomes more severe when he speaks of secret remedies.

"It is generally conceded by our apothecaries that about one-half of all their sales, in amount to customers is derived from this source, and if it were possible to obtain reliable statistics of the per capita or total consumption of these compounds within the Union, the American people would wake, and put in chains a traffic that panders to many vices, that seldom hesitates to any imposture, and as a rule considers the deception of the public to be a legitimate business." And again he says, "The proprietor of a secret remedy should have no more right to protection under the law as applied to trade marks than the freebooter of the ocean has to protection under the flag which has been so long recognized as the mark of his trade, and of the poison bottle; but we want a law to confirm this. The secrecy of any medicinal preparation should be *prima facie* evidence of fraudulent intent."

The report closes with a complete list of importations, giving the quantity, value and duty and the revenue, and advocates the cancellation of all revenue laws and inspection of imports.

It can easily be understood that a report of this kind caused some discussion and gave rise to a great many remarks. While, in a general way, Mr. Robbins was supported by the older members of the Association it was yet thought that his language in some places was too strong and that his demand that all drug laws should be repealed could not be well supported by the entire Association.

It was pointed out to him that the desire to have drug laws gave rise to the formation of the Association, and that no other body of men in the United States had been more active in inducing Congress to enact these laws than the American Pharmaceutical Association. Now to demand that all these laws be repealed would be to annul the whole history of the Association, and even if some of the laws were bad or badly executed,—if some of those entrusted with their carrying out had proven to be dishonest, and turned them to selfish purposes,—it must yet be admitted that an enormous amount of good had been done by these laws and that the demand for their repeal would not be in harmony with the history of the Association. After a lengthy debate the matter was referred to a committee under the chairmanship of Mr. W. A. Gellatly, who later on brought in the following resolution, which was adopted:

"*Resolved*, That in accepting the valuable and interesting report of the Committee on the Drug Market, this association does not endorse the portion referring to the utility of the law requiring the examination of foreign drugs before entry at the custom house (a law intimately connected with the origin of this body), believing that, however imperfect the law may be, its comparative fruitlessness has mainly arisen from the inability and unfitness of the agents appointed to execute its provisions."

Another very interesting report was that of the Committee on Legislation, regulating the practice of pharmacy, consisting of the President and other officers of the Association.

The report comprised forty-one pages and gives a complete history of the various legislations in the States as enacted at that time. It also gives a history of the various colleges, of the Boards of Pharmacy and their method of examination and their appointments. It then touches the question of adulteration and poison law; illicit selling and handling of liquor in drug stores and gives a number of letters from representatives in Congress, judges, and other members of importance, with reference to this matter. It finally offered a resolution:

"*Resolved*, That the President and ex-Presidents of this Association, attending this meeting, be appointed a committee to take into consideration,

"First, The propriety of drafting a law regulating the entire practice of pharmacy, to be presented to the legislatures of the different states and territories for their adoption, together with a memorial setting forth the duties of the profession to the public, and its actual and contemplated status;

"Second, The propriety of inviting the co-operation of the American Medical Association, and of the local Medical and Pharmaceutical Societies;

"And that the committee thus appointed be requested to report at a subsequent session."

After some debate the resolution was adopted without the second clause. Later on a new committee on the same subject was appointed by the President consisting of William Wright, Jr., of New York; Frederick Stearns, Detroit; J. Faris Moore, Baltimore.

It seems that the Association missed one great chance of usefulness in not taking up this question in a broader and more general sense. It is well known that since those days the physicians have applied to the legislatures and Congress for laws helping them in their practice and strengthening their position in the community and in law. If the pharmacists in those days had also undertaken to make pharmacy legislation a national issue, many of the difficulties that later

on arose and a good deal of the indifference that was shown in later years in various states towards the working of the American Pharmaceutical Association could now have been avoided.

From the many papers of a scientific nature that were presented at this meeting, we will mention the paper on "Commercial *Hydrargyrum Cum Creta*," the first paper read in the Association by Joseph P. Remington. Mr. H. W. Lincoln read an interesting paper on the Coat of Arms of Pharmacists, called "*Opiferque Per Orbem Dicor*"—(And I am called a bringer of help throughout the world.)

A very interesting and exhaustive paper was that of Dr. E. R. Squibb on "Carbolic Acid," at that time a new and almost unknown article. It strikes us to-day in almost a humorous way to notice in the debate that one member praised carbolic acid as a great invention, as a solution of it had cleaned his dog of fleas, while another one claimed that he had used it in the same way and found it entirely useless. Other papers related to the practice of pharmacy, the prescribing and preparation of various drugs, syrups and elixirs. They all showed a deep interest taken in this work all over the country and present a valuable record of the history of various preparations.

Mr. Parrish in a paper on "The Means of Improvement for Young Pharmacists," who were prevented from attending college, lays down three rules which will give them ability to practice their profession.

"First. Observation—The cultivation of the senses of sight, touch, taste and smell is of prime importance to the pharmacist, as it is indeed to every dealer in merchandise.

"Second. Experiment—The little word 'try' conveys a lesson which every one should learn at the very outset of his course.

"Third. Reading—Blessed agencies are good books in every scheme of education. What wonderful facilities for improvement do these furnish in the present day, as compared with any previous period."

The proceedings of this meeting, comprising about five hundred pages, is one of the most interesting and instructive books of the series. The observant reader, however, cannot avoid two general impressions. The first, the tedious and somewhat clumsy way in which the business of this now national Association is conducted, and what an enormous amount of time is wasted in reproducing and reading of reports that were of no use to the members and other unnecessary formalities. That a change in the method should soon take place is evident. Another impression of a more serious nature is that, sooner or later, dissension or difference of opinion of serious kind, must break out in the Association. The time of construction and building-up had almost passed. So far there was nothing but friendliness and the desire to accommodate each other's opinions, but the time had come when it would be necessary to step out, speak sharply and define the proper and most important objects of the Association in clear and precise words. Mr. Parrish, in one of his remarks, says: "We started out on a different basis from that in which we now conduct the Association. The ideas of those who originated it were more restricted in regard to membership and many other questions." Through the whole proceedings there go the rumblings of a distant thunder, announcing the storm that was soon to come.

The seventeenth meeting of the Association was held at Chicago in 1869. President Parrish being absent, the First Vice-President, Ferris Bringhurst,

presided in the first half, and the newly elected President, Ezekiel H. Sargent, at the second half of the meeting. There were one hundred and thirty-one members present at this meeting and many new members were elected, among them George W. Kennedy of Pottsville, Penn., who afterwards, was for many years the Secretary of the Council.

The report of the Committee on Progress of Pharmacy was presented by Dr. Hoffman, and while in a general way it follows the method of the former reporters, it differs particularly in so far as Dr. Hoffman added at various points criticism and suggestions. The report contains one hundred and sixty pages, being more than one-third of the volume and shows an enormous amount of zeal and arduous work. At the end, the reporter makes a strong appeal to divide the work among several members, claiming that it was too much for one. The Business Committee, in consequence of this suggestion, proposed a resolution making the committee to consist of three members, to be elected every three years and to divide the subjects among them, also that the report of the committee, in addition to being printed in the proceedings, should be published separately in book form. No action was taken on this proposition.

At this meeting, the most detailed and interesting report on the Pharmacopœia, was presented by Dr. Squibb. It embraced forty-eight pages and was an exhaustive review of all the enormous investigations and examinations that had been made by members of the Association and others, tending to improve the methods of the Pharmacopœia. Many articles were recommended to be dropped and others to be added, and the report bristled with many suggestions to the physicians in reference to the method and way of conducting the revision. As the Association was not an incorporated body at that time, this report could not be presented as coming from the Association, which had no representation in the Convention, but it was ordered to be printed, and no doubt had an important influence with the members of the Revision Committee.

The report of the delegates from this Association to the third International Pharmaceutical Congress held at Vienna this year was presented by John Faber, the only one who attended this Convention. It treated to some extent on the same questions as the previous one, and the following resolution, being the third one is of particular value:

"That the superintendence of the medical profession is incompatible with the present status of pharmacy, the pharmacist of our modern times being beyond what he was a century ago, and that he is entitled to self-government."

The 4th question, "Which way is to be adopted in order to obtain the most possible uniformity in the formulas and preparation of methods universally used?" was a continuation of the question about a universal codex. Faber reported as follows on this:

"A committee at Paris being engaged in working out a conspectus containing the different formulas of active remedies, with the view to have the Pharmacopœia of the different countries adopt uniform formulas in course of time; Congress expressed wishes for the committee to continue their labor in this direction, and to communicate with other pharmaceutical corporations about that subject."

The president in his annual address, which was a very able review of the activities and growth of the Association during the last year, dwelt at length

on the law to regulate the practice of pharmacy in the different States of the Union and to prevent the adulteration of drugs and medicines. He says:

"I cannot too highly commend this law to your serious consideration. Originally opposed to any attempt to prevent by legislation the evils which are so perceptible under our present unrestrained system, I have gradually arrived at the conclusion that the effort should now be made to exhibit to the legislatures of the several states such a law as, if it could be carried out, would be of immense advantage to the public, and would at once place pharmacy in its true position. The committee are aware of some imperfections in this draft, although it is the result of much careful study. I confess to grave doubts of its proving available in states in which our profession is not well organized."

His recommendation to fix the salary of the permanent secretary at $400.00 and that of the treasurer at $200.00 was later adopted. The Committee on Drug Market failed to bring in a report. The Business Committee recommended a number of changes of the Constitution, most of them relating again to the vexed question of raising funds. All the propositions and remarks relating to this subject were referred to the Committee for further consideration. This Committee prepared a lengthy report which was accepted and was to be acted upon at the following meeting in 1870. A great number of very interesting and instructive papers were presented at this meeting, most of them showing the great interest that the druggists of those days took in the investigation and determination of indigenous plants and articles of the Pharmacopœia in general. At this meeting also Mr. E. L. Milhau presented the first gelatin-coated pill and read an interesting paper on the same which was listened to with great interest and caused a very animated debate.

The two most important subjects, however, that made the meeting of 1869 a very remarkable one, were the reports of the Committee on the Law to regulate the practice of Pharmacy, and the expulsion of one of the most active and highly respected members of the Association.

Mr. W. Wright, Jr., as Chairman of the Committee charged with framing a law regulating the practice of pharmacy, reported verbally, that the Committee had attended to that duty and had the draft of the law printed in sufficient numbers to be distributed among the members present.

This draft of a proposed law which was printed in the proceedings is a very comprehensive and deep draft of a general pharmacy law. It is true there were some errors in it owing to the novelty of the work and the lack of experience of which the drafters of a later law of a similar kind could dispose, but it showed the deep thought and care that had been devoted to this work and would have been a good and serviceable model for the many State laws that were about to be formed and enacted in those days. It was hailed by some as the beginning of a new era, but it utterly failed of acceptance on account of the strong opposition of Dr. Squibb and a few of his friends who looked upon it from the standpoint of a physician, forgetting entirely that they were there as members of a Pharmaceutical Association and that the interests of the pharmacists should count first. At no other place in the proceedings, was the influence that Dr. Squibb exercised in those days at the Association, more pronounced than at this one, and while his remarks and his action do not detract at all from his reputation and great recognition as a pharmacologist, it is to be regretted that the older members of the Association did not muster courage

enough to oppose him in this one matter. It appears, to the historian, that the Association, in this one instance, missed its vocation. One of the greatest chances or possibilities to do good for American Pharmacy, was allowed to slip by, on account of this opposition and instead of framing a strong and forcible model-law for the various states, weak, compromise resolutions were passed.

These are some of Dr. Squibb's words with reference to this law:

"The pharmacist's vocation is entirely supplementary to the vocation of the physician; yet, here is a law that ignores physicians, and does not recognize the physician's diploma as entitling him to practice pharmacy, or to register as a pharmacist, while he is the only competent authority of the pharmacist and uses the medicines which the pharmacist prepares. I am willing to admit that the pharmacist knows more about preparing and compounding medicines than the physician does—not more than he should, but more than he does; that the pharmacist is the abler of the two in his profession, but that can never change the fact that the pharmacist is naturally and properly subordinate to the physician."

There were two ways open for the Association at that time, if they had understood the importance of the subject before them. They should either have come out boldly in direct opposition to the physicians, claiming that theirs is a profession of equal value and equal importance and that they were ready to deny and fight the assumed superiority of the medical profession or they should have made a strong and honest attempt to work in harmony with the physicians, who at that time were also framing new laws for their profession, and thereby make this harmony of the two professions one of the fundamentals of all new laws relating to medicine and pharmacy. The first standpoint was advocated by a number of members present at this meeting and from their remarks there can be no doubt that the animosity between pharmacists and physicians was much stronger and more pointed in those days than at any other time. It would have provoked a serious fight between the two professions, which however, would have resulted in the end in mutual respect and friendship.

Another way would have been to meet the physicians as friends and fellows. It is true many of them would have laughed at such an idea of recognizing a pharmacist as their equal, but those of better education and understanding, would have accepted the hand of friendship; laws would then have been framed far superior to those with which most of the States have struggled along, and by which the pharmacists failed to obtain the respect and acknowledgment of the public and medical profession. Looking back to those days, we now know that the physicians succeeded, for instance, in presenting their claims to the authorities of the army and navy, and that the highest physician in the army has the rank of General. If Pharmacy had joined Medicine in those days, we might to-day have a chief pharmacist with the rank of a Captain or Colonel. But the opportunity was lost, for the importance of the subject was not recognized and in place of presenting a working model law, resolutions of the following type were adopted:

"*Resolved*, That the difficulties of constructing a form of a law proper to be endorsed and recommended by this Association for general application in all states, are such that we must be satisfied with enunciating the broad principles which in our judgment should direct all legislation upon this important subject.

"*Resolved*, That we see with alarm and regret the rapid increase in the number of accidents which occur from mistakes and mismanagement in dispensing medicinal substances, and that we earnestly desire to see these casualties checked and controlled."

A compromise law was also adopted and it was resolved to send a copy of same to the governors of the different States of the Union.

The second great subject that came up at the meeting in 1869 was the proposition to expel Mr. Frederick Stearns, an ex-President of the Association, an active member at all the meetings and a man of the highest standing among pharmacists and the citizens of his home. Mr. Stearns had brought into the market a medicine for which he had adopted the name of "Sweet Quinine." The medicine, however, did not contain quinine, but cinchonine. The label did not state that it contained quinine, nor was the claim made, anywhere in the circulars, that the medicine contained quinine, the word "cinchonine" with an addition of being a good substitute of quinine was always used. In his explanation Mr. Stearns stated that he had adopted the word "Sweet Quinine" after long and careful consideration. That the medicine contained an alkaloid of the same tree, that the public did not know anything about cinchona, but knew what quinine was and that therefore it was no offense against ethics to use this word, particularly if all the circulars stated what the medicine contained.

The leading men of the Association, however, construed this offence as a direct violation of the code of ethics and claimed that he willfully practiced sophistication and fraud. It will be seen that the question simply turned on the value that is attached to the trade-mark as such. It is well known that in those days, and even afterwards, tradesmen of all kinds hunted for proper and catching names for their products, and it was not generally supposed to be necessary that the name of a trade-mark should be that of its contents. The debate which took place when the proposition to expel Mr. Stearns was brought forth, is one of the most interesting and touching readings of the proceedings of the Association. Everywhere the great service that Mr. Stearns had rendered the Association, his high virtues as a man, his amiability and faithfulness as a friend were extolled,—but he had not been ethical. The address that Mr. Colcord, this old veteran and stern representative of high professional ethics, made at this occasion is apt to bring tears to the eyes of even those that knew nothing of the intimate and true friendship, that up to that time, had existed between the two men. It reminds us of the deep patriotism and stern determination of Brutus when he plunged his dagger into the heart of his foster father; "Not that I love my friend less, but that I love Pharmacy more."

Mr. Stearns could have cleared himself easily if he had made the promise to discontinue the sale of the medicine; but he declined to make any promises. He too, was a man of high honesty and stubborn convictions. He said: "Judge me by what I have done, not by what I promise," and so he was expelled. The Association lost one of its most faithful and active members. During the fifteen years of his membership Mr. Stearns had, at every meeting, helped to uplift Pharmacy, to advocate what was good or right; he was no idealist or enthusiast like Colcord or Parrish; he went about the elevation of Pharmacy with a practical mind and his services were recognized by the Association by electing him to the highest honor of President. That we think more mildly of these things to-day is shown by the fact that he was elected a member some years later and it also shows how deep-rooted his admiration and love for the American Pharmaceutical Association were, when a year or two before

his death, as a successful and wealthy business man he again asked to become a member.

The charge has been made that the foundation of this action lay in commercial competition and envy, and that Mr. Stearns's success prompted a leading man from New York to present these resolutions. But how carefully the reader may look for any proof of this charge, it cannot be shown nor supported by records as they appear in the proceedings.

The question has often been asked why the Association was so severe with one of their best members, and many reasons more or less unsatisfactory have been assigned to this action. The real cause for this severity, however, lies in the peculiar psychological forces that sometimes move the human mind. Every leading man at that meeting felt that the action with reference to the pharmacy law, was unworthy of the lofty standing of the Association. There was that unconscious feeling that a mistake had been made, and that they had failed in the high vocation of the Association. Now, they wanted to assuage this feeling of dissatisfaction by being the severer in the following action. This swinging over, from leniency to severity, and the impression that an error committed in one direction, might be pardoned by extreme methods in the other direction is a human experience, not to say frailty. It shows itself daily in the individual, it appears in societies, in nations.

The history of the great men of the ancient Grecian republics is full of such sudden changes from admiration to contempt, from exalting to condemning. We, too, have had many instances of it in our own history. The treatment of the hero of Manila in the last Spanish war furnishes a good example. If the proposition made and earnestly urged by some members to censure Mr. Stearns and lay the matter over for a year had prevailed, Mr. Stearns would not have been expelled. The psychological excitement would have worn off and a cooler and quieter judgment been passed. But no matter in what light the individual may consider this action of the Association, it established one great fact, the importance of which overshadows everything else, and it is for this reason that your historian has given this subject so much time and investigation. The expulsion of Frederick Stearns impressed a character on the American Pharmaceutical Association that has not been effaced 'til to-day and never will be effaced. It declared to its members, to the pharmaceutical profession, to the whole world, that strict adherence to pure ethical honesty was its leading and most important feature; that neither long and faithful service, nor success in business, nor personal friendship could interfere with this principle, and that no sacrifice was too great to uphold it. The Association was here put to the most crucial test in its history, the temporary disagreement nearly disrupted it, but it came out of the severe trial victorious, purer and stronger. That the expulsion cast a gloom over the meeting, can easily be understood, and the next day, without further business of any importance, the members adjourned to meet again in Baltimore in 1870.

It must be considered a fortunate incident for the Association that the following meeting in 1870, the eighteenth, became more than anything else a business-meeting, under the influence of the excellent address of the President Ezekiel H. Sargent. He reviewed the affairs of the Association, not only the financial ones,

from the standpoint of a cool, sober, business man, eliminating from his address everything that might look like visionary ideals or enthusiasm. This was fortunate in more than one way; for it turned, for once, the minds of the members from the pursuit of scientific matters and a conception of their high vocation, back to solid facts and put before them the affairs of their work, their efforts and their hopes in sober and concise, even if dry, language.

Through the President's influence, the Association escaped the fate of so many noble and great enterprises, that they lose touch with reality, and, in the pursuits of high and lofty aims, forget the demands and cold facts of common life. President Sargent made a great many recommendations, the majority of which were accepted in the course of the meeting. For instance to supply money for the Committee of Progress of Pharmacy to purchase necessary journals; to create a new committee on adulteration and sophistication, consisting of such rising and enthusiastic men as Joseph P. Remington, Albert E. Ebert and William T. Wenzell; to have a general index of the proceedings of the last decade compiled; to direct the President to appoint authorized agents in the different States for the propagation of the Association; to appoint a Committee to take into consideration the invitation of the International Congress of Pharmacy to meet in the United States in 1876; and to create a committee of five on legislative action in pharmacy and the drug trade in general.

But the most important action of this meeting was the thorough revision of the Constitution and the providing of funds to put the Association on a firm financial basis. This new revision of the Constitution differed from the old one in many points.

It is this revision of the Constitution which, in essentials prevails to-day. Many changes became necessary through the growth of the Association and the establishment of different sections. An exchange of greetings with the Pharmaceutical Conference in England, that met at the same time in Liverpool, took place and an address was also sent to the North German Apothecaries' Association that met in the same year in the City of Dresden.

In the nomination and election of President, for the first time a break was made in the accustomed habit of selecting a new president from the place of meeting. Mr. R. Stabler of Alexandria, Virginia, was nominated and elected for the nineteenth meeting which was to assemble in St. Louis in 1871.

The committee on unofficial formulas was continued and Professor J. Faris Moore appointed president.

Among the many new members who joined at this meeting we notice the name of Charles Rice of New York, who afterwards became such a shining light of the Association.

The report of the committee of Progress of Pharmacy by Dr. Frederick Mahla, was as usual about one-third of the proceedings, and was a worthy continuation of the preceding ones. The committee on legislation in pharmacy in the different States, which had been continued from the previous meetings, reported the enactment of laws in the States of Rhode Island, Maryland and Pennsylvania and while these laws must be hailed as a decided progress in the development of pharmacy, they yet fell short of what they might have been, for reasons stated before.

Although this meeting was principally devoted to practical purposes, there were a long series of excellent papers by some of the leading men of those days. Mr. Joseph P. Remington read a very interesting paper on "Glycerin;" Mr. Squibb again reviewed the process of making fluid extracts and also continued his investigation on Rhubarb. His remarks on the manufacture of "Chloral" were highly interesting and received with great favor. Mr. Diehl pointed out that the indigenous drugs collected in the various parts of the Union were all shipped to New York; that it was sometimes impossible to find goods in Louisville that had been collected in its immediate surroundings and that much difficulty and delay was caused by this. Another paper devoted to "Medicinal Plants of Canada" was that of William Saunders. William Procter, Jr., read a very interesting treatise on "Morphiometric Process for the Pharmacopœia." He reviews the different methods proposed by different investigators and while his investigations lack that perfection which this work has attained at the present time, it yet showed a remarkable progress since 1862, when the committee reported that it was nearly impossible to make such investigations.

It had been customary since 1863 to add to the proceedings a short report on the social features of the Association, a custom that is continued to the present day. Another report that was handed in every year in those days, was a report on exhibits and specimens. It is to be regretted that the interest in this part of the annual meeting has disappeared, and that for many years such exhibitions have not taken place. The reason for it, if the historian is correct, is that these exhibitions took the feature of strictly commercial enterprises, while, in the beginning, specimens of all kinds of indigenous and foreign drugs, samples of rare plants, chemicals of special appearance or combinations, in fact, articles that tended to instruct and educate, were the main features of these exhibitions. The efforts to display living plants collected in the vicinity of the place of meeting that have lately been made, are good substitutes for these old exhibits and it is to be hoped that through their influence, the exhibits of educational subjects will gradually be revived. It was customary in those days for the Association to adjourn at a certain time that was fixed beforehand, for the purpose of visiting the exhibits.

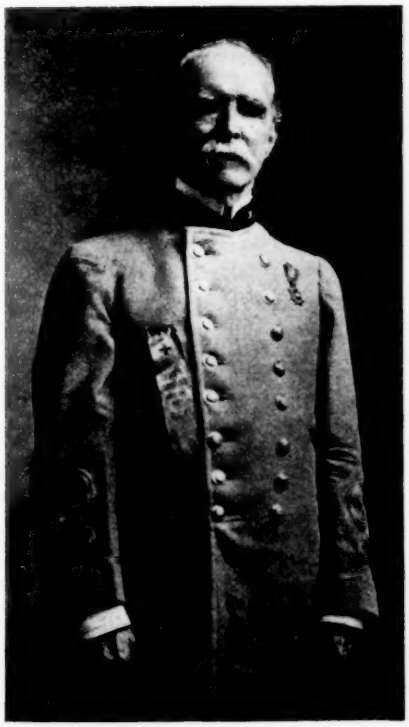
With this meeting the second part of the history of the American Pharmaceutical Association may justly be closed. There is a remarkable difference between the first and the second decade. In the first part the minds of the members soared on high. The meetings were conducted by their founders and the lofty ideals which had prompted these noble men to found the Association, were the leading inspirations of the meeting. The great political upheaval in the beginning of the "60s" naturally checked this ideal tendency in many respects and plain business considerations and sober thought took their places. This condition of affairs far from having injured the Association, was of enormous benefit and gave it strength and firmness. It was now not only well known and established in the United States but it had created attention and congratulations in other countries and it had boldly reached out for the International Congress of Pharmacy to be held on this hemisphere.

Another good feature in the development of the Association must be noticed

The old members who founded the Association were not jealous of the younger; with pride they saw the young men come in, they welcomed them cheerfully, they willingly gave them an opportunity to show their mettle and take active part in the workings of the Association. We have, therefore, in this decade, the first papers, the first words of mental individuality and scientific thought of so many new men, and it is a pleasure to notice how their sometimes impetuous and radical desires, were wisely checked and guided by the older men without any desire or effort to suppress their individuality.

Thus the Association was ready to reach out further and do greater and nobler work.

JOHN B. BOND, M. D.



Doctor Bond, the Chairman of the State Board of Pharmacy of Arkansas and a member of the American Pharmaceutical Association since 1883 attained the ripe age of seventy-eight years in November. He was born at Gettysburg, Pa. in 1836, but made an "early escape,"—as he gleefuliy terms it,—to Missouri where he was educated and grew to manhood. His early life was spent upon his father's farm, after which he "tried his luck" in California for three years. He then returned to Missouri and joined the Confederate Army being attached to the Medical Corps of the Division of General Sterling Price, his qualifications for that position being that he had studied medicine in the St. Louis Medical College, now known as Washington University. He attained the rank of Chief Surgeon of Little's Division, Price's Corps, then serving in Mississippi, and while acting as such officer, he saw General Little receive his death-wound at the battle of Iuka. Soon after this lamentable episode, Dr. Bond was made Medical Purveyor on the staff of General Holmes, and was assigned to duty in Arkansas. Here he met "his fate" in the "Belle of Little Rock," whom he espoused, and thereupon transferred his citizenship from Missouri to the "Bear State."

At the close of the Civil War he practiced medicine until 1872 when he embarked in the drug business, being the senior member of Bond's Pharmacy Co. of Little Rock.

He occupied the Chair of Chemistry of the Medical Department of the University of Arkansas for three years.

He was one of the organizers of the Arkansas Association of Pharmacists and was prominent in the enactment of the Arkansas Pharmacy Law, which is considered a most equitable and satisfactory law for a frontier state requiring but some additions concerning the enforcement of the law to make it a model one. For twenty years Dr. Bond has been the President of the Arkansas State Board of Pharmacy.

Section on Education and Legislation

Papers Presented at the Sixty-Second Annual Convention

MINUTES OF THE SESSIONS OF THE SECTION ON EDUCATION AND LEGISLATION.

FIRST SESSION.

The first session was called to order by Chairman Craig at the Hotel Pontchartrain on Wednesday morning, August 26th, at 9:30 a. m.

The first business being the reading of the Chairman's Address, Mr. Marshall was requested to take the Chair during its reading. [Chairman's Address printed in this issue.]

On motion of Prof. Sayre, seconded by Mr. Richardson, the address was referred to a committee of three to report thereon at this meeting; said committee to consist of Prof. Day, and Doctors Ruddiman and Wilbert.

Chairman Craig resumed the Chair and called for the Secretary's Report. Secretary Freericks read his annual report. [Printed in this issue.]

On motion of Mr. Mayo, seconded by Dr. Wilbert, the report was referred for publication, and the thanks of the Section were extended to the Secretary for his able and comprehensive report.

The Report of the Special Committee on Postal Regulations for the Mailing of Poisons was presented by the Chairman of that Committee, Mr. Mayo, and on motion of Prof. Day, seconded by Mr. Weinstein, the report was accepted and referred for publication, and the committee was discharged from further consideration of the subject.

Papers were read by Mr. Frank R. Eldred and Dr. Wilbert upon the proper enforcement of Drug Laws, both of which papers were referred for publication. [Papers printed in this issue.]

Mr. Mayo presented a resolution opposing the taxing of proprietary medicines. The motion was seconded by Mr. Wallace, and was adopted and referred to the Council.

Chairman Craig read a paper by Dr. Jacob Diner, on Pharmaceutical Education, and on motion of Mr. Mayo, seconded by Mr. Bodemann, it was referred for publication.

The report of the Syllabus Committee was read and on motion of Mr. Weinstein, seconded by Dr. Stanislaus, the report was received and approved and the recommendations therein made referred to the Council for action.

On motion of Mr. Richardson the Section adjourned.

SECOND SESSION.

The meeting was called to order on Thursday morning, at 9:30 a. m., by Chairman Craig. The reading of the minutes of the previous meeting was dispensed

with. Nominations for Officers of the Section were made as follows:— For President, Matthias Noll of Kansas, and Frank H. Freericks of Ohio; for Vice-Chairmen, Prof. Zada M. Cooper, and Messrs. W. S. Richardson and George B. Topping; for Secretary, Prof. R. A. Kuever of Iowa.

The Committee on National Legislation made its report through its Chairman, Mr. John C. Wallace. On motion of Prof. Sayre, seconded by Dr. Rusby, the report was accepted and referred for publication.

Prof. Arny moved that the recommendation to approve the principle of Price Standardization be referred to the House of Delegates. Mr. Freericks moved to amend by adding the words, "be referred with the approval of this Section." The motion as amended was adopted.

The report of the Delegates to the Drug Trade Conference was presented by Chairman Wallace. [Printed in September, 1914, issue.] On motion of Dr. Anderson, seconded by Prof. Arny, the report was accepted and adopted and the recommendation that the Association continue its membership in the Drug Trade Conference was approved.

An open discussion was then held upon the question submitted by Chairman Craig:— "The necessity of getting representation of the various interests embraced in the Association, in the consideration of Legislative Matters." This discussion was opened by Secretary Freericks, and participated in by Messrs. Sayre, Woodruff, Wallace, Anderson, Weinholt, Abbott, Arny, Mason, Rusby and Jordan. On motion of Prof. Jordan, seconded by Mr. Weinholt, the entire discussion was placed upon the table, and a motion to have a part of the discussion printed was declared out of order.

Prof. Sayre presented the report of the Committee on Drug Reform, and on motion of Dr. Rusby, seconded by Dr. Anderson, the report was accepted and referred for publication.

Dr. Stewart presented the report of the Committee on Patents and Trade-marks. On motion of Mr. Bodemann, seconded by Mr. Richardson, the first part of the report was referred to the Committee on Proprietary Medicines, and the resolutions contained in the report approved. [Printed in November issue.]

Associate Chairman Marshall then assumed the Chair and the report of the Committee on President's Address was read. [Printed with Chairman's Address.]

Dr. Anderson moved the adoption of the Report. Motion seconded by Mr. Richardson, and adopted.

The following officers were elected for the ensuing year:—

Chairman, Frank H. Freericks; Vice-Chairmen, W. S. Richardson, Zada M. Cooper and George B. Topping; Secretary, R. A. Kuever.

The Section then adjourned.

THIRD SESSION.

Section called to order by Chairman Craig. In the absence of the Secretary, Mr. W. S. Richardson acted in that capacity.

Papers were read as follows:—

On Pharmaceutical Education, by Frank R. Eldred.

Comparison of Lectures and Laboratory Practice, by W. B. Day. [Printed in this issue.]

A Plea for a Higher Standard for Entrance to Pharmacy, by C. B. Jordan. [Printed in this issue.]

Comparative Advantages of Practical Experience and General Education as a Prerequisite for Instruction in Schools of Pharmacy, by Dr. Rusby. [Printed in this issue.]

Dr. Anderson offered a resolution in approval of the Harrison Bill, which was adopted by the Section.

Adjourned.

ADDRESS OF THE CHAIRMAN.

If one but glance over Article I of the Constitution of this Association, he will conclude that the founders of the organization builded not for a clearing house of pharmacal thought, but for a militant organization resistant to the evils that then threatened, and now more direfully threaten, the calling, and active to overcome the lethargy in regard to educational, ethical, and professional standards, that hampers pharmacal progress. They hoped for a protagonistic organization, not an association of mere proclaimers. Quite well, along many lines, have their ideas been advanced, but the progress has not been what an active membership would have made it. Discussion there has been in plenty and some action too. That there has not been more action is no fault of the organization; there has been lacking among the individual members, that spirit, the lack of which differentiates the American from the citizen of other countries, that spirit of seeing to it that law-makers and law-officers take care of the law, of seeing to it that this board, or that body, performs its duties as they should be performed.

Have you, or have I, pointed out the short-comings of boards of pharmacy as servants of the law? Have we endeavored to rid pharmacy of the man who we knew full well was a detriment to the entire calling? Have you, or have I, raised any objection to the fraud perpetrated by the so-called "school of pharmacy" that graduates with a mark of 98 *per cent.* a young man who cannot write the full Latin name for epsom salt, or calculate the amount of a one-in-forty dilution of atropine sulphate required to make ten one-two-hundredth-grain dosages, or roll the corners off a pill? Have we not known the so-called "pharmacist" who would refill a prescription container from another pharmacy after smelling the receptacle and reading the label? Have we complained to the proper authorities concerning him? Have we exposed the druggist whom we knew was immorally, and perhaps illegally, selling narcotics? No; we have minded our own business—and let that business suffer from what really was neglect.

Along which of the two lines embraced within the purview of this section, education and legislation, we could achieve most for pharmacal advancement depends upon our bent and upon our environment. Legislation, to me, appears to be an over-exploited remedy for pharmacal ills. Education for pharmacists and for the public is of course a slower method of achievement and a method that requires constant attention; for public opinion, and pharmacal opinion as well

is evanescent—but education is a surer method; for, without education, legislation fails utterly.

There are so many problems in present-day pharmacy, that are being studied for solution along legislative lines, that they can merely be mentioned in an address that must necessarily be brief—a chairman, as I see it, should formulate and direct the program for his section, rather than occupy the greater portion of it. Others who will come before you will tell of the past year's endeavors to standardize all sorts of things from the shape of tablets of mercuric chloride to the graduations of nursing bottles. They will tell you how accroached rights and public welfare have clashed in the struggle against the drug evil; how the medicine pedler has practiced pharmacy, and the dispensing doctor has been above the law, a law apparently enacted for the protection of the public, but more evidently for the restriction of the pharmacist. When they have told you these things, do you, I pray, read the first article in your constitution and enlist in the endeavors that it purposes?

Let me call your attention to some educational needs of pharmacy; there are but two important among these. One important need is education; the other is educators. The need for education is two-fold. The pharmacist should be an educated man and the man in pharmacy should be an educated pharmacist. Slowly but surely there is dawning in general educational circles the light whose rays were first focalized by Froebel, the light that shows that to do is to know; and sense-training is fast taking the place of memory-cramming in educational methods. Glad will be the day when this light illumines pharmacal education, when the pharmacy student's thoughts are directed toward the real purpose of instruction, the imparting of that knowledge that constitutes education, and away from the examination at the end of the semester or the tests by the board of pharmacy; when he comes to look upon instruction as a means toward an end and not as an end in itself.

The preliminary education that the pharmacy student should have, has been standardized to a certain extent, but apparently it has been standardized for the sake of standardization rather than for the purpose of getting an educated pharmacist. Mathematics, physical science, introductory chemistry, logic—these are necessary in the foundation of any professional education. They are usually conspicuously absent from among the counts upon which the pharmacy student certificate is granted. None can be of service to pharmacy who is but crammed with learning and has not the initiative that is the first characteristic of education. Look over a lot of theses prepared by candidates for a degree in pharmacy, even for the doctorate: What initiative, what originality, do they indicate? The fault is not all in the teaching of pharmacy; much of it lies farther back in the educational life of the student; and pharmacal instruction has a difficult task in building a trained professional man upon no other foundation than a crammed memory.

That there is a lack of efficient pharmacal educators is evident to any one who has any knowledge of educational methods and educational results. It is not enough that a man be an authority in his subject, to make him an efficient instructor of others. If he has not a thorough knowledge of human nature and at least a fair grasp of the psychology of imparting and receiving instruction, he

cannot instruct. The real teacher can tell through observation of the faces before him—he needs not wait for the examination to determine it—which, among his students, are memorizers, which miss the point of the instruction entirely, and which catch and fix the idea independent of the words in which it is expressed There is a need for trained educators in pharmacy and this Association should endeavor to remedy it.

Few of us have not heard criticism of the apparent divergence of the lines along which schools of pharmacy and boards of pharmacy, determine the fitness of practitioners of pharmacy. That there is a divergence is evidenced by some statistics collected by my associate, Mr. R. A. Kuever, which show that of 1,497 graduates of pharmacy schools, examined recently by seventeen boards of pharmacy, only 65.06 *per cent.* were passed. Can we say, therefore, that the schools of pharmacy are not doing their duty? Is it, on the other hand, that the boards of pharmacy are poor judges of pharmacal fitness? This is a question that this Association might well take under consideration. Some other figures collected by Mr. Kuever are interesting in this connection. He found that thirty boards of pharmacy examined five thousand three hundred and ninety-three applicants for registration in a given period and passed 54.55 *per cent.* Twelve of these boards had examined graduates, so-called, of short-course, or cramming, schools, to the number of three hundred and ninety-one. Of these 49.36 *per cent.* were passed. Evidently the regular school of pharmacy is a little better judge of pharmacal fitness (on a board standard) than is the cramming school. As far as Mr. Kuever was able to ascertain, there are twelve of these cramming schools that are well known; this number does not include the correspondence-course institutions. These cramming schools are without standards; but they get half their students past the board.—and to pass the board is the chief desire of by far the greater number of pharmacy students.

There are many legislative problems upon which the chairman might base recommendations to this section, but I prefer to leave these to the several committees and delegations that have to do with legislative matters. Let me, however, suggest that you take an active part in the attempts to restrict the traffic in narcotics to moral lines, paying particular attention to the necessity for the restriction of physicians and especially veterinarians who are not amenable to very stringent laws of any sort; that you do not overlook the present-day opportunity to achieve a much-desired reform in our patent laws relative to medicinal products; that you leave not to the civic organizations the survey and regulation of the practice of pharmacy; that you coöperate in the conservation of real pharmacy; that you, in short, become protagonists for the purposes set forth in Article I of the Constitution of the American Pharmaceutical Association.

In the educational field, I would recommend: (1) That this Association create a committee to survey pharmacal educational methods.

(2) That this Association take steps toward the supplying of efficient pharmacal educators trained along pedagogic, as well as pharmacal, lines.

(3) That this Association interest itself in the modern movement toward the concrete and practical in general educational practices.

(4) That this Association concern itself with the coördination of the methods

of schools of pharmacy and boards of pharmacy, particularly that practical pharmacy may be conserved.

(5) That this Association take steps toward securing the better enforcement of the statutory provisions that safe-guard the practice of pharmacy.

As a topic for discussion at the meetings of state pharmacal organizations next year, I suggest this:— "Should the Ownership of a Pharmacy be Restricted to a Registered Pharmacist?"

Respectfully submitted,

HUGH CRAIG,
Chairman.

REPORT OF COMMITTEE ON CHAIRMAN'S ADDRESS.

Your committee, to whom was referred the address of Chairman Craig, takes this opportunity to express its appreciation of the excellence of the address, its admiration of the sentiments therein contained and its concurrence with the suggestion offered for the improvement of pharmaceutical education and legislation.

We endorse the recommendation that the Association use its best efforts to secure such restrictions of the traffic in narcotics that shall include all who are responsible for the abuses in the dispensing or sale of narcotics.

We endorse also the recommendation relative to the reform of our patent laws concerning medicinal products; likewise, the suggestion that pharmacists themselves should undertake the survey and secure the regulation of pharmacal practice, and not leave these vital matters to organizations which are non-pharmacal in character.

We believe that the survey of educational methods mentioned by our chairman should be carefully considered by this section, and, that a committee should be appointed to report a plan of classifying all the various institutions now engaged in giving instruction in pharmacy in this country.

We advise that the recommendation of our chairman concerning the coördination of the methods of schools and boards of pharmacy be made a subject for discussion and action at the joint session of schools and boards with this section and to the same joint session we would refer the recommendation that steps be taken to secure the enforcement of the statutory provisions that regulate the practice of pharmacy.

We approve of the chairman's suggestion of submitting a topic for discussion at the meetings of state pharmaceutical associations next year, and, we recommend that the secretary of this section communicate this suggestion to the secretaries of the various state pharmaceutical associations.

W. B. DAY,
M. I. WILBERT,
E. A. RUDDIMAN.

REPORT OF THE SECRETARY.

This report of your Secretary, in keeping with custom, will be largely devoted to legislative changes which have taken place during the year and to rulings and court decisions of importance. An effort has been made to compile some matter of possible historical and statistical interest pertaining to institutions of pharmaceutical learning, but owing to lack of response in some instances, this work as originally planned has not been fully completed, but it is nevertheless made a part of this report, so that if deemed of sufficient interest, it may be completed by some subsequent Secretary.

LEGISLATIVE ACTIVITY.

During the year, apart from the United States Congress, there have been legislative sessions in Alaska, Georgia, Kentucky, Louisiana, Maryland, Massachusetts, Mississippi, New Jersey, Rhode Island, South Carolina, Vermont and Virginia. In nearly all of these legislative bodies, bills were submitted which in one manner or another were of interest to pharmacy. Aside from the United States Congress laws pertaining to pharmacy were enacted only in Massachusetts, New York and Rhode Island. Since the scope of intended legislative activity was of a nature to cover a very broad field, it seems best that only actual enactments or such measures as are yet likely to be enacted, find consideration.

Massachusetts:—In Massachusetts a law was enacted to further regulate the sale of the important narcotics other than cocain, the sale and disposition of which was covered by an enactment of the previous year. A complete copy of this new Massachusetts law, is made a part of this report, because of its special interest.* An analysis of the new law brings out the following special features, which are not generally found in such legislation as proposed at this time. Preparations sold in good faith for diarrhea, cholera, neuralgia, may contain six grains of opium or three-fourths of a grain of morphin to the fluid or avoirdupois ounce. Dover's Powder and veterinary preparations containing not over ten grains of opium, or one and one-fourth grain of morphin, to the ounce, and compound medicinal tablets, pills and powders, containing not more than one-twentieth of a grain of morphin, or one quarter of a grain of codein to each pill, powder or tablet, are also specifically exempted, when distributed in good faith. Veterinarians are specifically prohibited from prescribing the drugs for human-beings, and Physicians and dentists are prohibited from prescribing the drugs for persons known by them to be habitual users. This last named provision is immediately qualified by another provision, which sets out that nothing in the Act shall prevent practitioners of medicine, dentistry or veterinarians, from prescribing or using the drugs whenever indicated for any patient, so long as it is not done to evade the provisions of the Act. Physicians, dentists and veterinarians are required to keep a record of the names and addresses of all patients to whom they dispense the narcotics. Persons who falsely represent themselves as physicians, pharmacists, or others legally authorized to secure the drugs are made violators of the Act. It will be noted that much was sought to be accomplished by this new law, but its spirit appears to extend far beyond its actual letter. The requirement upon physicians, etc., to keep a record of the names and addresses of patients to whom they dispense the narcotics seems of little value, because they are not required to state the quantity dispensed and the day of dispensing. The law seems to properly distinguish between dispensing and administration, for it is evidently not required that a record be kept of the drugs which are administered.

New York:—During the year New York has enacted three laws which are of special interest. One of these, known as the Boylan Law, like the Massachusetts Act already referred

* See appendix.

to, provides regulations for the distribution of narcotic drugs other than cocain, which is governed by an act of the previous year. Another, known as the Walters Law, governing hours of employment, and finally a new Trade Mark Law. The Walters Law provides separate regulation to govern work hours and employment in pharmacies and drug stores, as differing from work hours for employment generally, and seems to limit authority for the enforcement of laws governing employment in drug stores with the general authorities having in charge the enforcement of Pharmacy Laws.

The New Trade Mark Law makes the following a misdemeanor under heavy penalty.

"A person who shall knowingly sell, offer or expose for sale any article of merchandise, and shall orally or by representation, name or mark written or printed thereon, or attached thereto, or used in connection therewith, or by advertisement, or otherwise, in any manner whatsoever. make any false representation as to the person by whom such article of merchandise or the material thereof was made, or was in whole or in part produced, manufactured, finished, processed, treated, marketed, packed, bottled, or boxed, or falsely represents that such article of merchandise or the material or any part thereof has or may properly have any trade-mark attached to it or used in connection with it, or is or may properly be indicated or identified by any trade-mark, is guilty of a misdemeanor."

The law seems principally to be aimed at substitution, and within its provisions would undoubtedly be included the sale in bulk of articles which are sold from original containers and regarding which the practice of substitution may have been more or less prevalent.

The Boylan Law is intended to govern the sale of chloral, and of opium and its alkaloids, salts and derivatives. Because of its many important and new features, it is made a part of this report in its entirety. [The bill was printed in full in the Journal of June, 1914, P. 902. Ed.] The following provisions are deserving of special attention. Sales may be only on physician's prescription other than for preparations containing minimum quantities, and the prescription must contain the name of the physician, etc., his office address, office hours, telephone number, name, age and address of person to whom and date on which it was issued. Physicians may not issue a prescription to any person unless they first have made a physical examination of such person and then find the drugs to be indicated. Prescriptions containing more than four grains of morphin, thirty grains of opium, two grains heroin, six grains of codein, or four drams of chloral, must first be verified by communicating with the prescriber. Prescriptions may not be filled later than ten days after they have been issued. Persons filling a prescription must either issue a certificate or show on the label, the name and address of the persons selling. the name and address of the physician, etc., date of sale, and name of person to whom such sale is made. Possession of the named drugs by any person other than those legally authorized to handle them, is a misdemeanor, unless such possession is authorized by the certificate or label in question. Purchases and sales in the trade must be made on official order blanks furnished by the local Health Board, and such blanks can be had only by persons legally authorized to handle the drugs. Physicians, druggists, pharmacists, veterinarians and dentists must keep on record the name and address of each person to whom they administer or dispose of the drugs, together with the quantity so disposed of or administered. Hypodermic syringes may be sold only on the written order of a physician or veterinarian, and a record of such sale must be kept. Provision is made for the commitment of habitual-users to hospitals or institutions which are licensed under the State Lunacy Commission. Provision is made for the revocation of licenses issued to physicians, dentists, veterinarians, pharmacists or nurses upon proof that the licensee is addicted to the use of habit-forming drugs.

It is not the purpose of this report to discuss to any extent the provisions of this new New York Law, but attention is called to the fact, that the requirement for a certificate to the purchaser or alternatively to show the same matter on the label would include the need for setting out the contents of the drugs named. The advisability of making this requirement may be doubted. The purpose of course is, to enable the possessor of such drugs to prove lawful possession, but, in actual practice, the purchaser for legitimate use is not apt to have preserved such certificate in case he should be called upon. To require physicians to keep a record of the drugs which they themselves may administer seems an unnecessary burden, while the requirement for them, as well as druggists, pharmacists, etc., to keep a record of name,

address and quantity dispensed or disposed of, places New York in the foremost rank of those states properly seeking to control the narcotic evil, that is, of course, if the law is to be extended in this respect to cover all narcotics.

Rhode Island:—In Rhode Island an amendment to the narcotic laws of that state was enacted, looking toward the better enforcement of said law. The amendment provides, as of special interest, that no person, other than a manufacturer or jobber of drugs, wholesale druggists, registered pharmacists or assistants, registered physicians, dentists, or veterinarians or others who under the law are entitled thereto, may possess the drugs, unless possession can be shown to be under a physician's prescription.

FEDERAL LEGISLATION.

During the last and present session of Congress an enormous number of bills have been introduced which are of interest to pharmacists. At this writing none of them have been enacted into law, but it is likely that, at least, some will become laws before Congress adjourns. Among the numerous bills introduced and pending may be mentioned those which would regulate the sale of bichloride of mercury; to provide price maintenance; to prevent unfair competition; the Hinebaugh Bill to tax mail order houses; in general, either amendatory or supplementary to the Sherman Anti-Trust Act; to amend the Food and Drug Act; the Hughes-Bacon Bill to improve the condition of pharmacists in the Army; to prevent fraudulent advertising; to regulate the use of trading stamps and coupons; to amend the present patent laws; the Harrison Anti-Narcotic Bill, and many other legislative proposals touching upon almost every activity in which the pharmacist is interested. It is to be regretted that no progress has yet been made in securing a law to improve the status of pharmacists in the Army.

Of the many national legislative proposals, it will be impossible to discuss other than a few of the more important ones, and among these must, of course, be considered, as of prime importance, the Harrison Anti-Narcotic Bill, the Price Maintenance Bills and the Trade Commission Bill, which includes a provision with reference to unfair competition. Aside from the Harrison Bill, it is impossible even at this time to discuss the various other specially important legislative propositions, because they are being changed almost daily in some form or another, so that it is quite impossible to know from day to day in what form they may be.

The various Price Maintenance Bills now pending in Congress are typified largely by the so-called Stevens Bill, known as H. R. 13305. During the past year most wonderful progress has been made in popularizing the idea of price maintenance and standardization, and the support which has been given to such measures from many different sources, gives ground to hope that the cut-rate evil, which has so sorely afflicted the retail drug trade of the country, will within a reasonable time be largely checked, if not entirely overcome. The Stevens Bill, which is the most popular along this line, would legalize contracts affecting Interstate Commerce, whereunder the original producer or manufacturer will have the right to prescribe the price at which his trade-marked or specially-branded articles shall be re-sold. It is rather noteworthy that this bill does not aim to include patent or copy-righted articles, unless it was thought that their inclusion might lessen the chances for successful enaction. With reference to trade-marked and specially-branded goods, the bill, and others of the same type, are undoubtedly designed to overcome the decision of the Supreme Court in various cases

which held such contract-control to be unlawful. Whether due regard has been given to Constitutional limitation may be a question for more thorough consideration. The intended legislation is framed under the Interstate Commerce authority of the Federal Government, and not under any special authority which the Federal Government has, with reference to trade-marked or specially-branded articles. The question, therefore, may arise as to whether Congress has the legal authority under the Interstate Commerce clause to make special provisions regarding the price of certain articles which enter Interstate Commerce to the exclusion of other articles or property which are also in Interstate Commerce. Whatever the requirement may be ultimately found to be with reference to this matter, there is but little doubt that in some form a measure can be properly framed. For the present, legitimate dealers throughout the country, which include the large number of retail druggists, can be congratulated on the enormous strides which have been made towards legalizing maintenance and standardization of prices. The outlook has never before been so hopeful.

The Trade Commission Bill, which is now pending in the Senate, known as the Newlands Bill, includes, as already stated, a provision against unfair competition, which has found expression in numerous other bills, all having the same purpose. It would seem that much good is looked for by many, to come from this proposed legislation, with particular reference to unfair competition. It is likely, however, that such possible good has been largely over-estimated. Unfair competition is an extremely broad term. It would be found, or not found, according to the state of mind of the person with whom the decision rests. When left for decision to a Commission, such Commission would be bound by the present status of the general law as defined in court decisions. In late years, court decisions, either directly or indirectly, have held certain practices, which the retail trade particularly claim to be unfair competition, as not being unfair. It would seem that any law which would control and restrict unfair competition, as we understand it, should define the practice which must be regarded as unfair, and in the absence of such definition, little, if anything, will be gained.

Harrison Bill:—Faulty features which were recognized by some to be contained in the Harrison Anti-Narcotic Bill have during the year been largely corrected. In the end, absolute necessity for making the record-keeping requirement applicable to physicians, dentists and veterinarians was also more generally recognized, and an amendment proposed which to a large extent will be helpful in correcting the early defect. On the other hand, these needed changes in the bill have served to make plain that the real opposition to effective and sufficient control over the sale and use of narcotics is found with some part of the medical profession and those who are allied with them. This opposition found expression in an amendment as offered by Senator Pomerene, which is intended to exempt the physician and others altogether from the operation of the proposed law. In just what form the Harrison Bill will now be enacted, it is not possible to say. It may not be enacted at all at this session of Congress, which certainly is to be desired if the law is not to contain a requirement for record-keeping equally applicable to all.

COURT DECISIONS, RULINGS AND REGULATIONS.

There have been a number of court decisions and department rulings and regulations which are of vital concern. Among them as of greatest importance reference should be made to the following:—

Itinerant Vendors:—During the year a decision of the Supreme Court of the United States on the Louisiana Itinerant Vendors Law, has attracted general attention. The decision is of importance. It was rendered in the case of Baccus vs. the State of Louisiana. It appears from a statement of facts, that the sale of drugs and medicines in any form by itinerant vendors is prohibited under the Louisiana Law. A number of defenses were set up under which it was claimed, that the act in question was unconstitutional, both under the State and under the Federal Constitution. The finding of the Louisiana Court was against the defense, and a conviction entered, and the case was then carried to the United States Supreme Court. Chief Justice White, rendering the decision for the Supreme Court, in substance merely found that the law was not in conflict with the Federal Constitution. It of course is a recognized fact that the police powers belong exclusively to the several states, and where a measure must be recognized as one exercising the police power, and is not altogether unreasonable, it cannot be declared unconstitutional under the Federal Constitution, after having been held constitutional under the State Constitution. While the opinion of Chief Justice White, contains expressions which would uphold the Louisiana Law, regardless of this limitation, the limitation, nevertheless, must be regarded as controlling. The decision of the United States Supreme Court in this case, really means, that it will not disturb the decision which may have been rendered by the highest court of the several states on a question of this kind. It will be remembered, that the Illinois Court of Appeals, held an Itinerant Vendor's Law of that state to be in conflict with the constitution of the state, and had it been possible to carry that decision to the Supreme Court of the United States, it is altogether likely, that it would also have been affirmed. Therefore, notwithstanding the decision of the Supreme Court of the United States in this case, it is optional with the State Courts of every state other than Louisiana, to reach a decision directly opposite to the one announced by the Louisiana Courts. It is likely, that the courts of most states will continue to hold, that an Itinerant Vendor's Law must be uniform in application, either in that it will apply to itinerant vendors of all kinds in like manner, or that its uniformity will be based on making a distinction between qualified and unqualified vendors, whether they be itinerant or not.

Saccharin Law:—Legislation and rulings have been quite general to prevent the use of saccharin in food-stuffs and soft-drinks. A law preventing the use of saccharin in soft-drinks was lately held by the Missouri Supreme Court to be discriminatory, and therefore unconstitutional, because it was not made applicable to food-stuffs in general.

Insecticide Laws:—In Ohio an Insecticide Law of such wide scope as to include, practically, every drug which may be used as an insecticide or fungicide, and requiring special license and labeling has been successfully contested in the lower courts. The Ohio Commission, with whom the enforcement of this law rests, have averred that they had no intention to construe it beyond reasonable bounds, but the letter of the law certainly would permit them to do so, and a ruling by the National Insecticide and Fungicide Board of the Department of Agriculture, under the National Insecticide Act, with reference to peroxide of hydrogen, would certainly indicate, that there can be a disposition to extend the widest possible scope to such laws.

Philippine Formula Labeling Law:—A reference to this is possibly not appropriate under decisions and rulings, but it is of such importance as to deserve notice. This new Philippine Law will compel the labeling of all patent and proprietary medicines with their complete formulas. There seems to be some authority with the Department of State to modify legislation in the Philippine Islands, but without such possible modification, the law in question became effective July 1st.

The New York Health Department:—Some of the late actions of the New York Health Department, would indicate that said department is clothed with unusual powers. The action of this department in this respect, is of special interest, because it has amended the

Sanitary Code by prohibiting entirely the sale of preparations which contain the generally permitted minimum quantity of narcotics, and has also adopted an ordinance which prohibits the use of wood-alcohol in preparations of all kinds intended for internal and external use. One not conversant with the constitutional limitations which govern the New York City Health Department, can hardly understand the wide authority which it would exercise. Evidently, this department is the first one of those which seem to have legislative authority, to go so far as to prohibit the sale of preparations containing a very slight quantity of narcotics, such as paregoric, etc. The action of the Health Department is also remarkable in view of the Boylan Law just enacted in New York State, and wherein at least by indirection, preparations containing minimum quantities are exempted. If there are no constitutional limitations, which would prevent the New York Health Department from enacting such a provision, after the enaction of a general law by the State, then it must be doubtful as to whether there be any constitutional limitations to govern said Body.

Parcel Post:—The wide discretion and authority given the Postmaster General with reference to the Parcel Post Law, has already caused the extension of parcel post facilities beyond what Congress was willing to specifically provide. Even greater extensions appear to be contemplated, and the present Postmaster General seems to be willing to go far beyond the limits which would prevail, if Congress had retained to itself the power of extension.

Postal Laws Governing the Transmission of Poisons:—With reference to the use of mails for shipping medicinal preparations, postal regulations continue to be in an unsatisfactory state. Changes have been proposed both by the Drug Trade Conference and by the Drug Trade Section of the New York Board of Trade. The greatest difficulty in finding a proper solution for this problem, which has confronted the Postal Authorities, seems to rest in the fact, that a definition for the word "Poison" yet remains to be found.

Treasury Decision regulating the Importation and Sale of Cocain:—During the latter part of last year a decision was rendered by the Treasury Department under which it was sought to practically control the distribution of cocain and its derivatives, as well as coca leaves in all channels throughout the country inclusive of importation. Under the decision, every person desiring to secure the articles in question, is required to declare, that they are intended to be used in good faith, and in a manner not dangerous to health. The declaration-requirement appears so broad as to include even such declaration from a person receiving the drugs on prescription. The decision would appear to be an altogether impossible one beyond that part which governs importation. The Bureau of Chemistry, at an early time, announced that it did not find in the decision the wide scope which plainly appears to be therein, and held, that the requirement did not apply to distribution on physicians' prescriptions. While the decision may be enforced, as with reference to importation, it does not appear, generally, to have been extended beyond that point.

Guaranty under the Food and Drugs Act:—The three Secretaries having supreme control over the Food and Drugs Act and its enforcement, early in the year, rendered a decision to abolish the guaranty requirement to be shown on packages of food and drugs. This requirement is too well understood to need discussion. The order abolishing the requirement was first to become effective with May 1st, 1915, but a subsequent order was made postponing this to May 1st, 1916, and as to products already packed and labeled prior to that time, to November 1st, 1916. Under the change as proposed, guarantees are to be made on invoices, or in other manner apart from the product. While it may be true that the guaranty legend has been misused in the sense of causing misunderstanding and practical misrepresentation, there is no good reason for going from one extreme to another. To place the retailer in a position where he will be dependent upon his invoices, to prove that the responsibility rests with someone else, seems to be entirely uncalled for. In this connection it is to be noted, that many manufacturers most heartily approve of the new ruling. The thought has been advanced from different sources, that the danger of deception and misunderstanding, might be entirely avoided by abolishing the use of the word "Guaranty", and by making the requirement simply to show serial number under the Food and Drugs Act; requiring such exact wording as under the ruling, would be held equivalent to the Guaranty. Such method certainly appears likely to produce far better and more satisfactory results.

APPENDIX.

MASSACHUSETTS NARCOTIC LAW.

An Act to regulate the sale of opium, morphin and other narcotic drugs.

Section 1. On and after the first day of January, nineteen hundred and fifteen, it shall be unlawful for any person, firm or corporation to sell, furnish, give away or deliver any opium, morphin, heroin, codein, cannabis indica, cannabis sativa, or any preparation thereof, or any salt or compound of the said substances, except upon the written prescription or written order of a registered physician, dentist, or veterinary surgeon, bearing the name of the physician, dentist, or veterinary surgeon giving it, which prescription when filled shall show the date of each filling and shall be retained on file by the druggist filling it for a period of at least two years, and it shall not again be filled except upon the order of the prescriber, given in person or in writing. The prescription shall not be copied, except for the purpose of record by the druggist filling the same, and it shall at all times be open to inspection by the officers of the state board of health, the board of registration in pharmacy and its authorized agents, and by the police authorities and police officers of cities and towns. But the provisions of this act shall not apply to prescriptions, nor to the sale, distribution, giving away, or dispensing of preparations and remedies, if such prescriptions, preparations or remedies do not contain more than two grains of opium or more than one quarter of a grain of morphin, or more than one quarter of a grain of heroin, or more than one grain of codein, or more than one-half of a grain of extract of cannabis indica, or more than one-half of a grain of extract of cannabis sativa, or any salt or compound of any of them in one fluid ounce, or, if a solid or semi-solid preparation, to the avoirdupois ounce; nor to liniments, ointments or other preparations which are prepared for external use only; nor to preparations containing any of the said substances which are sold in good faith for diarrhea or cholera or neuralgia, and which do not contain more than six grains of opium or more than three quarters of a grain of morphin to each fluid ounce, or, if a solid or semi-solid preparation, to the avoirdupois ounce; nor to Dover's Powder; nor to veterinary preparations containing not over ten grains of opium or more than one grain and a quarter of morphin to each fluid ounce, or, if a solid or semi-solid preparation, to the avoirdupois ounce; nor to compound medicinal tablets, pills or powders containing not over one twentieth of a grain of morphin or one quarter of a grain of codein or any of their salts, except heroin, to each pill, powder or tablet; provided that such preparations, remedies or prescriptions are sold, distributed, given away or dispensed in good faith as medicines, and not sold for the purpose of evading the provisions of this act.

Section 2. It shall be unlawful for any practitioner of veterinary medicine or surgery to prescribe any of the drugs mentioned in section one of this act for the use of a human being, and it shall be unlawful for any physician or dentist to prescribe, sell, give away or deliver any opium, morphin, heroin, codein, cannabis indica, cannabis sativa, or any preparation thereof, or any salt or compound of said substance to any person known to such physician or dentist to be an habitual user of those drugs.

Section 3. The provisions of this act shall not be construed to prevent any lawfully authorized practitioner of medicine or of veterinary medicine or of dentistry, from prescribing, administering or dispensing any drug that may be indicated for any patient under his care; provided, that such prescribing, administering or dispensing, is not for the purpose of evading the provisions of this act; and provided, further, that every physician, veterinarian and dentist shall keep a record in a suitable book of the names and addresses of all patients to whom he dispenses narcotics.

Section 4. Any manufacturer or jobber and any wholesale druggist and any registered pharmacist, physician, veterinarian or dentist may sell opium, morphin, codein, heroin, cannabis indica, cannabis sativa, or any preparation thereof, or any salt or compound of such substances to any manufacturer, jobber, wholesale druggist, registered pharmacist, physician, veterinarian or dentist, or to any incorporated hospital; but such substances or preparations, except such as are included within the exemptions set forth in section one shall be sold only upon a written order duly signed by such manufacturer, jobber, wholesale druggist, pharmacist, physician, veterinarian, dentist or superintendent of such incorporated hospital, which order shall state the article or articles ordered and the date. The said orders shall be kept on file in the laboratory, warehouse, pharmacy or store in which they are filled by the proprietor thereof, or his successors, for a period of not less than two years from the date of delivery, and shall be at all times open to inspection by officers of the state board of health, members of the board of registration in pharmacy, or their authorized agents, and by the police authorities and police officers of cities and towns.

Section 5. Any person who, for the purpose of evading or assisting in the evasion of any provision of this act shall falsely represent that he is a physician, dentist or veterinarian, or that he is a manufacturer, jobber, wholesale druggist, or pharmacist, or an agent or employee of an incorporated hospital, or who, not being an authorized physician, dentist or veterinarian, makes or alters a prescription for any of the said substances, shall be deemed guilty of a violation of this act.

Section 6. Whoever violates any provision of this act shall be deemed guilty of a misdemeanor, and shall be punished by a fine of not less than fifty nor more than one thousand

dollars, or by imprisonment in the house of correction or jail for a term not exceeding one year, or by both such fine and imprisonment.

Section 7. Chapter two hundred and seventy-one of the acts of the year nineteen hundred and ten is hereby repealed.

Section 8. This act shall take effect on the first day of January, nineteen hundred and fifteen.

SOME FACTS OF HISTORICAL AND PRESENT-DAY INTEREST CONCERNING PHARMACEUTICAL INSTITUTIONS.

As already stated, an effort has been made to collect some matters of historical and statistical interest concerning pharmaceutical institutions of learning. The scope of this effort will be recognized from details hereinafter set out. Unfortunately, some institutions failed to respond to several requests for information and, therefore, the work is not complete. Out of the total number of eighty colleges, departments and schools of pharmacy, which, from various sources, were learned to now exist within the United States proper, responses were received from fifty-six. Of this number thirty-nine (39) were reported to be either endowed or to be supported in varying degree by public funds, in one form or another. During the year the Pharmacy Department of the Starling-Ohio Medical College was merged with the College of the Ohio State University. At the close of the college year, the school of pharmacy of the Texas Christian University, of Fort Worth, was discontinued. The various institutions from which responses were received and which, of course, do not include any information from such as have been discontinued from time to time, are shown, collectively, to nave had a total of 35,824 graduates since their organization. During the 1914 school year they had 5100 matriculants and 359 special students, making a total of 5459 who were receiving their education at said institutions. The same institutions conferred a total of 1700 degrees at the close of the 1914 college year. An effort was made to separate the various degrees as conferred, depending upon the varying character of study and time, but the different customs and conditions in this connection, made such altogether a hopeless task. However, the total number of graduates as credited for the year have had, at least, a two-year course. It is not out of mind, that out of the total number of graduates, some must have had higher degrees conferred after graduating in pharmacy, but this is not likely to materially effect the total number.

The summary herein before shown, has been compiled from the following information as submitted by the several institutions which have extended kind attention, and matters of general and statistical interest are shown separately as with reference to each, compiled in alphabetical order according to states in which they are respectively located.

Alabama. School of Pharmacy, Birmingham Medical College. The college organized in 1894, School of Pharmacy in 1903. Organization largely due to Drs. B. L. Wyman, E. P. Hogan, L. C. Morris, J. D. S. Davis, R. M. Cunningham, B. G. Copeland, F. A. Lupton, J. M. McLester and Park. First regular course of instruction commenced 1903. In the year 1914 had fifty-one matriculants and no special students. In 1914 conferred degrees of Ph. G. (two-year course) upon eighteen; Ph. Ch. (two- or three-year course) upon five; B. S. in Phar. (four-year course) upon one; Phar. D. (one-year graduate work) upon one. Total twenty-five.

California. California College of Pharmacy, University of California. Organized in 1872. Organization largely due to James G. Steele, William M. Searby, William Simpson, William T. Wenzell, Winchell Forbes, Dr. H. H. Behr and John Calvert. This institution occupies state premises, and building rent free. First regular course of instructions commenced 1872. Has conferred degrees upon eight hundred seventy. In 1914 had one hundred twenty matriculants

and two special students and conferred degrees of Ph. C. (two-year course) upon forty-three; Phar. B. (three-year course) upon one. Total forty-four.

College of Pharmacy, University of Southern California. Organized in 1905. Organization largely due to Walter Taylor, Laird J. Stabler, C. W. Hill. First regular course of instruction commenced in 1905. Has conferred degrees upon one hundred twenty-one since organization. In 1914 had eighty matriculants and conferred degree of Ph. C. (two-year course) upon thirty-five.

Colorado. School of Pharmacy of the University of Colorado. Organized in April, 1911. Organization largely due to the activity of Dr. W. P. Harlow, Messrs. W. A. Hoover, E. L. Sholtz and Chas. Ford. First regular course of instructions commenced Sept. 1911. Is supported by legislative appropriation. Has conferred degrees on five persons. For the year 1914 it had twenty matriculants and two special students, and conferred the Degree of Ph. C. (two-year course) upon four, and the Degree of B. S. in Pharmacy (four-year course) upon one.

District of Columbia. National College of Pharmacy of George Washington University. Organized in 1872. Affiliated with George Washington University 1906. Organization largely due to J. L. Kidwell, Chas. Stott, Dan'l. B. Clarke, J. P. Milburn, R. B. Ferguson, J. C. Fill, Z. D. Gilman, Jos. W. Nairn, W. S. Thompson, G. G. C. Simms, J. D. O'Donnell, D. P. Hickling, Oscar Oldberg and Frank C. Gaither. Commenced its first regular course in the Fall of that year, and has been continuously operating since that time. Not endowed and not supported by public funds. Has conferred a total of four hundred and fifty-three degrees. For the year 1914, conferred the degree Phar. D. (three-year course) upon eleven. For the year 1914 it had eighty matriculants and sixteen special students.

Washington, D. C. Pharmaceutic College of Howard University. Organized March 2, 1867. Organization largely due to Drs. Chas. B. Purvis, Prof. Materia Medica; G. S. Palmer, Prof. Pharmacy; and S. L. Loomis, Prof. Chemistry. First regular course of instruction commenced January 2, 1870. Not endowed and not supported by public funds. Has conferred a total of two hundred forty degrees. For 1914, conferred the degree of Phar. D. (three-year course) upon nine. For the year 1914 it had sixty-two matriculants and one special student.

Georgia. University of Georgia, School of Pharmacy. Organized in 1903. Organization largely due to Dr. W. B. Hill, Dr. S. C. Benedict and R. C. Wilson, Ph. G. First regular course of instruction commenced in 1903. Discontinued in 1904 for one year, because of fire. Supported by legislative appropriations principally. Has conferred degrees on thirty-five persons. For the year 1914 had twenty-two regular students. In 1914 conferred the degree of Ph. G. (two-year course, two terms, nine months each) upon seven.

School of Pharmacy, Mercer University. Organized 1903. Organization largely due to Prof. J. F. Sellers, Professor of Chemistry at Mercer University, and doctors and druggists of Macon, Ga. First regular course commenced fall of 1903. Supported as a Baptist institution. Has had ninety-six graduates since its organization. In 1914 thirty-nine matriculants and conferred degree of Bachelor of Pharmacy upon ten (two-year course.)

Illinois. Northwestern University School of Pharmacy. Organized in 1886. Organization largely due to D. R. Dyche, E. H. Sargent, T. H. Patterson, Wm. Bodemann, H. S. Maynard and Oscar Oldberg. First regular course of instruction commenced September 3, 1886. Not endowed and not supported by public funds. Has conferred degrees upon approximately, 2050. In 1914 had one hundred twenty-four matriculants and eight special students and conferred degrees upon fifty-seven graduates in Pharmacy and twelve Pharmaceutical Chemists.

University of Illinois, School of Pharmacy. Organized in 1859, as the Chicago College of Pharmacy and became a part of the University of Illinois in 1896. Organization largely due to the pharmacists of Chicago, F. Scammon, J. M. Woodworth, F. Mahla, J. D. Payne, S. S. Bliss, W. H. Muller, Geo. Buck, L. F. Humiston, E. O. Gale, F. A. Bryan, E. L. O'Hara and others. First regular course of instruction commenced in November, 1859. No teaching from 1860 to 1870, although the organization, library, museum, etc., were continued. It is supported by state appropriations; last appropriation was $10,000 annually for two years. Has conferred degrees upon about sixteen hundred. In 1914 had one hundred matriculants and eighty-three special students and conferred degrees on thirty-nine graduates—Ph. C. degree (two-year course) five. Ph. C. (three-year course) one. Ph. G. (two-year course) thirty-three.

Indiana. Purdue University School of Pharmacy. Organized in 1885. Organization largely due to Drs. Smart and J. N. Hurty. First regular course of instruction commenced in 1885. Supported by public funds and by tuition. Has conferred degrees upon about eight hundred. In 1914 had fifty-four matriculants and conferred degrees Ph. C. (two year course) sixteen. B. S. degree (four-year course) two.

Valparaiso University, Department of Pharmacy. Organized the Institution in 1873, Department in 1892. Organization largely due to Dr. H. M. Evans and Prof. A. E. Hiss. First regular course of instruction commenced in 1892, graduating its first class in August, 1893. Supported by endowment and state funds. Has conferred degrees upon one thousand one hundred and twenty-one. In 1914 had one hundred and forty-three students, about twenty-eight of which were special students, and conferred degrees on forty-five Ph. G. (two-year

course of nine months each) and six Ph. C. (two-year course of twelve months each) graduates.

Indianapolis College of Pharmacy. Organized in 1904. Organized as a Department of the Winona Technical Institute. First regular course of instruction commenced in September, 1904. Not endowed or publicly supported. Has conferred degrees upon three hundred. In 1914 had fifty-four matriculants and three special students, and conferred the degree of Ph. G (two years required, twenty-six and thirty-six weeks each) upon twenty-two. Ph. C. (two-year course, twenty-six and thirty-six weeks each) upon four.

Iowa. The College of Pharmacy of the State University of Iowa. Organized in 1885. Organization largely due to J. H. Harrison, Davenport, Iowa; Geo. H. Schafer, Ft. Madison, Iowa; E. L. Boemer, Iowa City, Iowa. First regular course of instruction commenced September, 1885. Supported by the State of Iowa, being a part of the State University of Iowa. Has conferred degrees upon three hundred seventeen. In the year 1914 had sixty-seven students, and conferred Ph. G. degree (two-year course) upon fourteen. Ph. C. degree (three-year course) upon three.

Highland Park College of Phar., Highland Park College. Organized in 1891. Organization largely due to Dr. O. H. Longwell and Dr. S. R. Macy. Is controlled by Presbyterian Church and supported to the extent of $200,000 by public since taken over. Was self-supporting before that time. First regular course of instruction commenced in September, 1891. Has conferred degrees upon about one thousand one hundred, many more having taken work. In 1914 had sixty matriculants and thirty-five special students and conferred degrees Ph. G. (two years; twenty-five weeks) upon fourteen Ph. C. (two years, thirty-six weeks course) upon nine.

Kentucky. Louisville College of Pharmacy. Organized August 16, 1870. Organization largely due to C. Lewis Diehl, John Colgan, Geo. A. Newman, F. J. Pfingst, H. H. Rademaker, C. Tafel, Geo. Zubrod, Arthur Peter, Graham Wilder, Floyd Parks, etc. First regular course of instruction commenced in 1871. Not endowed and not publicly supported. Has conferred degrees upon six hundred eleven graduates, 1914 inclusive. For the year 1914 had eighty-three matriculants and conferred Phar. D. degree (two-year course) upon twenty-nine.

Louisiana. New Orleans College of Pharmacy. Organized 1900. Organization largely due to F. C. Godbold, M. T. Breslin, W. T. Taylor and Phillip Asher. First regular course commenced November 5, 1900. Not endowed and is not publicly supported. Has conferred degrees upon two hundred sixty-seven. For the year 1914 had eighty-one regular and two special students and conferred degrees of Ph. G. (two-year course) upon twenty.

New Orleans. School of Pharmacy, College of Medicine, Tulane University of Louisiana. Organized 1838. First regular course commenced 1838. Was discontinued during the Civil War, 1862-65. Shares the endowment of School and College of Medicine, $1,000,000. Has conferred four hundred and twenty-eight degrees. For the year 1914 had seven students, and conferred Ph. C. degree (two-year course) upon three.

Flint Medical College, Department of New Orleans University. Was organized in 1900. Organization largely due to Dr. Clements. First regular course commenced 1900. The Medical College, of which the Pharmacy School was formerly a part, had a $10,000 endowment. Has conferred fifty-nine degrees. For the year 1914 had twenty-six regular students, and conferred Ph. G. degree (two-year course, eight months each) upon eight.

Maryland. Department of Pharmacy, University of Maryland (Maryland College of Pharmacy, 1841-1904.) Organized 1840. Incorporated 1841. Organization largely due to Drs. Samuel G. Baker, W. E. A. Aikin, William Riley; Pharmacists, Thomas G. Mackenzie, Geo. W. Andrews, David Stewart, Robt. H. Coleman, B. H. Atkinson, John Hill, Jonathan Chapman and J. W. M. Gordan. First regular course commenced November, 1841. Discontinued 1847 to 1856, because of the few students and lack of interest in the college on the part of pharmacists. Not endowed or publicly supported. Has conferred one thousand sixty-one degrees. For the year 1914 had seventy-three regular students and three special students, and conferred twenty-four degrees of Phar. D. (two-year course.)

Massachusetts. Massachusetts College of Pharmacy. Organized in 1823. First regular course of instruction commenced in 1867. Is endowed with about $240,000. Has conferred about eight hundred and ninety degrees. In the year 1914 had two hundred and twelve regular students and twenty-six special students, and had thirty-two graduates in pharmacy (two-year course) and seven pharmaceutical chemists (three-year course.)

Michigan. School of Pharmacy, University of Michigan. Organized 1868. Organization largely due to Dr. Albert B. Prescott. First regular course commenced October, 1868. Is supported entirely by the state. Has conferred one thousand one hundred and seventeen degrees. In 1914 had ninety-eight regular students and nine special students, and conferred B. S. degree (four-year course) upon three; Ph. C. degree (two-year course) upon twelve. Owing to change in the course, the number of graduates was less than usual.

Minnesota. College of Pharmacy of the University of Minnesota. Organized in 1892. Organization largely due to the Minnesota State Pharmaceutical Association and the University of Minnesota Board of Regents. First regular course commenced in 1892. Not endowed but received recent legislative and other appropriations to the amount of $109,000,

used for the erection of fireproof new pharmacy building. Has conferred three hundred and forty-four degrees. In 1914 had ninety-nine students, and conferred Ph. M. degree (four-year course) upon two. Ph. B. degree (two and three-year courses) upon twenty-eight.

Missouri. Kansas City College of Pharmacy and Natural Sciences. Organized 1884, re-organized 1898. Organization largely due to S. Emery Lamphear, A. M., M. D., Randall R. Hunter, M. D., Julies G. Kiefer, M. D., Ph. G., Thos. J. Eaton, M. D. First regular course commenced 1887-1888. Not endowed and not supported by public funds. Has conferred four hundred and forty-three degrees. In 1914 had forty-seven regular students and eight special students and conferred Ph. G. degree (two terms of eight months each, four years experience) upon fifteen. Ph. B. degree (two terms of eight months each, two years experience) upon three.

St. Louis. School of Pharmacy, National University. Organized 1904. Organization largely due to Barnes Medical College. Was re-organized by National University and the name changed 1912. First regular course of instruction commenced 1904, as Barnes College. Not endowed. Has conferred one hundred fifty degrees since organization. In 1914 had twenty-eight regular students and two special students, and conferred Ph. G. degree upon seven; Ph. C. upon one, and one special with no degree.

Montana. University of Montana, School of Pharmacy. Organized 1907 in connection with the state agricultural college and transferred July, 1913, to the University at Missoula. Organization largely due to state board of education. Is supported by state funds and from moneys from State Land Grants. First regular course of instructions commenced in September, 1907. In 1914 had thirteen matriculants and two special students, and conferred the degree of Ph. C. (three-year course) upon one. Has conferred fourteen degrees since organization.

Nebraska. Creighton University, College of Pharmacy, Omaha. Organized September 1, 1905. Organization largely due to board of trustees. First regular course commenced September 1, 1905. University has sufficient endowment. Has conferred about three hundred forty degrees. In the year 1914 had as students: Seniors, seventy-five, one special; juniors sixty-six, regulars, three specials, and conferred Ph. G. degree (two-year course) upon sixty-two.

School of Pharmacy, University of Nebraska. Organized in 1908. Organization largely due to E. Benj. Andrews, Chancellor Rufus A. Lyman, Henry B. Ward, Samuel Avery and Chas. E. Beasey. First regular course commenced in September, 1908. Supported by taxation, approximately $20,000 per year. Has conferred about thirty-seven degrees. In the year 1914 had thirty-seven regular students and two special students, and conferred degrees on eleven students. B. Sc. (four-year course) upon two. Ph. C. degree (three-year course) upon two. Ph. G. degree (two-year course) upon seven.

New Jersey. Department of Pharmacy, College of Jersey City, (formerly University of the State of New Jersey.) Organized in 1908. Organization largely due to pharmacists, physicians and business men of Jersey City and New York. First regular course commenced in 1908. Has conferred Ph. G. degree upon eighty-two and Phar. D. upon fifty-nine since organization. In the year 1914 had ninety-nine regular students and one special student and conferred Ph. G. degree (two-year course) upon sixteen; Phar. D. (three-year course) upon thirty-five.

New York. Albany College of Pharmacy, Department of Pharmacy, Union University. Organized in the year 1881. Organization largely due to Willis G. Tucker, M. D.; Jacob S. Mosher, M. D.; and Gustavus Michaelis. First regular course of instruction commenced October, 1881. Has conferred seven hundred and forty degrees since organization. In 1914 had one hundred and ten regular students and five special students, and conferred degree of Ph. G. (two-year course) upon forty-one.

Brooklyn College of Pharmacy. Organized in 1886. Organization largely due to the Kings County Pharmaceutical Society. First regular course of instruction commenced in 1890. Has conferred Ph. G. degree to one thousand three hundred and forty-two students and Phar. D. degree to one hundred and forty-six since organization. In 1914 had three hundred regular students and conferred Ph. G. degree (two-year course) upon one hundred and ten and Phar. D. degree (three-year course) upon twenty-nine, making a total of one hundred and thirty-nine.

Buffalo College of Pharmacy (By permission, legal title, Department of Pharmacy, University of Buffalo.) Organized in 1886. Organization largely due to Dr. Matthew D. Mann, (McKinley's surgeon), Prof. Witthaus, chemist. First regular course of instruction commenced September, 1886. Has conferred degrees upon eight hundred and twenty-one since organization. In 1914 had one hundred and thirty-five pharmacists, forty chemics, and six special students, and conferred degrees upon fifty-six graduates in Phar., (Ph. G.) and fourteen analytical chemists, (A. C.)

College of Pharmacy of the City of New York, Columbia University. Organized 1829. Organization largely due to Messrs. John D. Keese, Henry H. Schieffelin, Constantine Adamson, John L. Embree, and many others. First regular course commenced in 1829. Has conferred degrees to four thousand and ninety-four pharmacists. In 1914 had five hundred and fourteen students and conferred degrees of Ph. G. (two-year course) upon one hundred and

thirty-six; Ph. Ch. (two-year course, course now three years) upon twenty; Phar. D. upon six and upon Food and Drug Analysts, two.

Fordham University, College of Pharmacy, New York City. Organized in 1911. Organization largely due to Rev. Father Thos. J. McClusky, president of university. Dr. J. J. Sheridan, registrar, and Dr. Jacob Diner, pro-dean. First regular course commenced September, 1911. Has conferred degrees upon seven since organization. In 1914 had thirty-eight regular students and seven special students and conferred degree of Ph. G. (two-year course) upon seven.

North Carolina. Leonard School of Pharmacy, Raleigh, N. C. Organized in 1890. Organization largely due to Henry Martin Tupper. First regular course commenced November 2, 1891. Has conferred degrees upon one hundred and nine since organization. In 1914 had twenty-seven students and conferred Ph. G. degree upon two.

School of Pharmacy, University of North Carolina. Organized in 1897. Organization largely due to Dr. F. P. Venable, Chapel Hill; Pres. E. A. Alderman, now president University of Virginia. It is supported by University. First regular course of instructions commenced September, 1907. Has conferred degrees upon, approximately, one hundred and fifty since organization. In 1914 had forty-eight matriculants and eight special students and conferred degree of Ph. G. (two-year course of nine months each) upon four.

North Dakota. School of Pharmacy, North Dakota Agricultural College. Organized 1902. Organization largely due to the druggists of the state and to E. F. Ladd. First regular course commenced in the fall of 1902. Supported by land endowment fund, national appropriation and state appropriation. Has had forty-three graduates and some three hundred students not graduates. In 1914 had twenty-nine regular students and conferred degrees of Ph. G. (two-year course) upon five and B. S. (four-year course) upon one.

Ohio. Ohio Northern University, College of Pharmacy. Organized in 1885. Organization largely due to President H. L. Lehr. Is supported in part, by a $200,000 endowment. First regular course commenced in the fall of 1885 and has had about one thousand and one hundred graduates. In 1914 had ninety-six regular students and conferred degree of Pharm. Grad. upon thirty-three, course requiring two years of thirty-two weeks each.

College of Pharmacy, Ohio State University. Organized in 1885. Organization largely due to Professor Sidney A. Norton and Professor Geo. B. Kauffman. Is supported by funds appropriated to the university and then set apart for the college. First regular course commenced September, 1885. Has conferred degrees upon about two hundred and ninety-five. In 1914 had ninety-five regular students and ten special students and conferred degrees of B. Sc. in Pharmacy (four-year course) upon six; certificate, Ph. C. (two-year course) upon seventeen.

Cincinnati College of Pharmacy. Organized March, 1850. Organization largely due to Wm. S. Gordon, Jas. M. Ayers and C. Smith. Was discontinued during Civil War. Messrs. E. S. Wayne, Wm. B. Chapman and A. Fennel being instrumental in its re-organization. Mutual interchange of knowledge and discussions commenced in 1850. Has conferred fully one thousand degrees since organization. In 1914 had forty-two regular students and conferred degree of Ph. B. (twelve hundred-hour course) upon thirty and degree of Ph. C. (seventeen hundred-hour course) upon two.

Oregon. North Pacific College of Pharmacy, a department of North Pacific College. Organized in 1907. Organization largely due to Dr. Herbert C. Miller. Department is supported by North Pacific College. First regular course commenced in 1908. Has conferred forty-three degrees since organization. In 1914 had twenty-eight regular students and eleven graduates received Ph. G. degree (two-year course.)

Oregon Agricultural College, Department of Pharmacy. Organized in 1899. Is supported by state and federal funds. First regular course commenced in September, 1899. Has conferred degrees upon seventy-eight with B. S. degree. In 1914 had sixty-nine regular students, conferred B. S. degree (four-year course) upon four and had three graduates from two-year course.

Pennsylvania. Medico Chirurgical College, Department of Pharmacy and Chemistry, Philadelphia, Pa. Organized in 1898. Organization largely due to Dr. John V. Shoemaker, Dr. Geo. H. Meeker, the board of trustees and medical faculty of the Medico Chi. College. First regular course commenced in September, 1898. Has conferred degrees upon about seven hundred graduates. In 1914 had one hundred and sixty-four regular students and conferred degree of Phar. D. (four-year course) upon three; Ph. C. degree (three-year course) upon twelve; Ph. G. degree (two-year course) upon forty. Total fifty-five.

Pittsburg College of Pharmacy, School of Pharmacy, University of Pittsburg. Organized in 1878. Organization largely due to Messrs. W. G. Schirmer, Louis Emanuel and J. B Cherry. First regular course commenced on October 1, 1878. Has conferred degrees upon about one thousand six hundred. In 1914 had two hundred twenty regular students, and three special students and conferred degrees of Ph. G. (two-year course) upon eighty; Ph C. (three-year course) upon one; Phar. D. (three-year course) upon five; Certificate of Proficiency (two-year course) upon two.

Philadelphia College of Pharmacy. Organized in 1821 by druggists of the city and districts. Incorporated, 1822. First regular course commenced in 1821. Has conferred degrees upon six thousand, three hundred sixty-three. In 1914 had four hundred eighteen regular

students and forty-nine special students and conferred degrees of P. D. (three-year course) upon one hundred five; P. C. (three-year course) upon eleven; six certificates of Proficiency in Chemistry (three-year course); one certificate of Proficiency in Food and Drugs (two-year course); twenty-three certificates in Bacteriology (ten-weeks course.)

South Carolina. Medical College of the State of South Carolina, School of Pharmacy. Organized in 1882. Discontinued in 1884 and resumed in 1894, and has continued in operation since. First regular course commenced in 1882. The college being owned by the state this school in conjunction with the school of medicine, supported by the state. Has conferred three hundred twenty-two degrees. In 1914 had forty-three regular students and conferred degree Ph. G. (two-year course) upon twenty-one.

Tennessee. Department of Pharmacy, Vanderbilt University. Organized in 1879. Organization largely due to Bishop McTyeire, President Board of Trustees, Chancellor Garland. First regular course commenced in 1879. No endowment or public funds, other than those of the university. Has conferred approximately three hundred fifty degrees since organization. In 1914 had forty regular students and conferred degrees of Ph. D. upon seven and Ph. C. upon three.

University of Tennessee, School of Pharmacy, Organized in 1898 as an integral department of the state university and maintained for the first twelve years with the seven other departments in Knoxville, Tenn. First regular course commenced in 1898. Removed from Knoxville to Memphis 1911, where it has since absorbed the University of Memphis, College of Pharmacy. Integral part of the state university supported by appropriation from the state Has conferred degrees upon sixty-two since organization. In 1914 had sixteen regular students and conferred degrees of Ph. C. upon ten; the two-year course hereafter leads to Ph. G. certificate. The three-year course to the Ph. C. degree.

Meharry Pharmaceutical College, Walden University. Organized 1889. Organization largely due to Meharry Family, Rev. J. Branden and G. W. Hubbard, M. D. Not endowed and no public funds. First course commenced October 7, 1889. Has had two hundred six graduates. In the year 1914 had fifty-two regular students and conferred degree of Ph C. upon eight.

Texas. School of Pharmacy, Medical Department, Texas Christian University. Organized in 1905. Organization largely due to M. H. Gilmore, Ph. C., M. D., Fort Worth, Texas; R. W. Needham, Ph. C., Fort Worth, Texas. First course commenced October 10, 1905. Has conferred degrees upon sixty-one since organization. In 1914 had fourteen regular students and two special students and conferred degrees upon six graduates in Phar. (two-year course)

Virginia. School of Phar., Medical College of Virginia, (Result of Amalgamation of Virginia School of Phar. and Department of Pharmacy, University College of Medicine in July, 1913.) Organized 1893. Both schools forming the merged institution, were organized through their board of trustees. First regular course commenced in 1893. The Medical College of Virginia, of which School of Phar. is a part, receives $5000 annually from the state. The total number of degrees conferred from both schools forming merger is about five hundred. In 1914 it had sixty-six regular students and five special students, and degrees of Ph G. was conferred upon twenty-five graduates (two-year course, eight months each.)

Washington. University of Washington College of Phar., Seattle. Organized in 1894. Is supported as a department of the university by a mill-tax. First regular course commenced fall of 1894. Has conferred degrees upon about one hundred fifty since organization. In 1914 had eighty-one regular students and conferred degree of Ph. C. (two-year course) upon thirteen and degree of B. S. (four-year course) upon six.

State College of Washington. Organized in 1896 when Department of Pharmacy was added. Organization largely due to the members of state legislature. Supported by state and federal funds as a part of the state agricultural college. First regular course commenced in 1896. Has conferred degrees upon one hundred sixty since organization. In 1914 had thirty regular students and conferred Ph. G. degree (two-year course) upon ten; B. Sc. degree (four-year course) upon one.

Wisconsin. University of Wisconsin Course in Pharmacy. Organized in 1883. Organization largely due to Wisconsin Pharmaceutical Association. Is supported by legislative appropriation. First regular course commenced in 1883. Has conferred degrees upon three hundred twenty-eight since organization. In 1914 had thirty-nine regular students, and one special student and conferred Ph. G. degree (two-year course) upon seven and B. S. degree (four-year course) upon five.

Marquette University, School of Pharmacy. Organized 1893 as private school, 1900 as a department of the Milwaukee Medical College, 1907 as a department of Marquette. Organization largely due to R. E. W. Sommer, Ph. D. Is supported by university funds. Up to 1900 it merely gave "quiz" courses. After that date it gave regular courses leading to degrees. Has conferred degrees upon one hundred ninety since organization. In 1914 had fifty regular students, and twenty-four special students and conferred degree Ph. G. (two-year course) upon twenty-one and Ph. C. degree (three-year course) upon three.

Respectfully submitted,

FRANK H. FREERICKS,
Secretary.

COMPARATIVE REAL AND PERMANENT BENEFIT TO THE STUDENT OF LECTURES AND LABORATORY PRACTICE.

W. B. DAY, PH. G.

I would certainly not have ventured upon the preparation of a paper covering so broad a field, were it not for the assurance of our chairman, at whose request this paper was prepared, that it would be intended simply as a basis for discussion and that the subject would be restricted to the student of pharmacy. Had the choice been left to me, I think I should have elected as a subject, "Some Thoughts on Teaching," and the discussion then might have become an "experience meeting!"

At the outset, we may safely assume that there is no difference of opinion among pharmaceutical teachers in regard to the great importance—even the absolute necessity of laboratory courses. Few would assign an *inferior* position to laboratory instruction in valuing the *curriculum* of the pharmaceutical school.

The chief object of teaching is to train the mind to clear thinking,—the power to forecast what will happen under given conditions. The imparting of information, however necessary or desirable, especially to the professional or technical student, must nevertheless be regarded as of secondary importance.

Laboratory-practise best gives the training which enables the learner to successfully attack new problems, hence its immediate bearing upon actual life, where new problems and new conditions are constantly being presented.

In the laboratory the student learns from his mistakes, and with less serious consequences than in after life. In lecture courses, on the other hand, the lecturer presents information which has, perhaps, cost years of study and preparation and sets this forth in attractive form with demonstrations and explanations such as clarify the subject in hand and make it as simple and as easily grasped as its nature permits. The interest of the learner is aroused, his enthusiasm grows, reference reading is suggested, he is led to a sincere desire to know, which is the hall-mark of the real student.

The dangers of the lecture system arise from this very ease by which information is imbibed. We are all apt to underrate what is easily attained, the surmounting of obstacles, the courage and will-power growing out of effort and the joy of achievement gained over difficulties, are largely lost.

Yet, we must not forget that the instruction in our schools of pharmacy, until within a few decades, consisted exclusively of lectures; and by means of this instruction or through it, many pharmacists of superior professional attainments were developed. If you reply that the drug-store training afforded in those times a more acceptable substitute for laboratory-practise than it does at present, I grant the truth of your argument, but not its sufficiency. No one can say which form of discipline is best in every case. So much depends upon the teacher and not less upon the student. Garfield's definition of a university was, "Mark Hopkins on one end of a log and a student on the other."

We may be sure that when we fail to interest, we fail to educate. The first requisite to success in teaching, is the ability to create or to awaken this desire

to learn. But to interest, does not mean to amuse, though some pupils seem to incline to this view. A former associate of mine could never escape the feeling that a considerable number of his pupils regarded the carefully prepared and exceedingly interesting experiments, with which he illustrated his lectures in chemistry, as a sort of vaudeville performance.

Unfortunately, many students in schools of pharmacy are studying, not primarily to equip themselves for their life-work, but rather to attain some object which should be of secondary importance—to pass the state examination for license or to secure just sufficient credits to obtain a diploma. Seldom does a class distinguish itself by showing a general interest in the studies all along the line.

One reason for lack of interest by pharmaceutical students, is the opinion held by some pharmacists that success in college does not especially fit the student for a successful career. Occasionally this view has been impressed upon otherwise bright and capable young men, and results in an attitude of cynicism and indifference not easily overcome.

Again, a small proportion of the student-body seem to hold the opinion that when their fees are paid, the teachers should do the rest. They seem to take seriously the words which Mr. Dooley wittily puts in the mouth of the college president who asks the incoming freshman: "What branch iv learnin' wud ye like to have studied f'r ye be our compitint profissors?"

But how much want of real interest is due to causes outside the student, to prosy and uninteresting lectures, to a routine of carelessly-supervised laboratory operations and to dry and formal text-book recitations, which undertake to force set tasks on reluctant youth?

The problems we encounter here will not be solved by sitting down and thinking about them. More intimate and personal contact between teacher and pupil, so that each may better acquire the viewpoint of the other, will be of great help. This implies smaller classes or at least smaller groups and more carefully inspected,—more closely checked,—work, it means more time from both teacher and student.

Rigorous exclusion of incompetent and idle students early in the course will aid wonderfully. As President Nichols of Dartmouth said, "It is difficult to conduct a college which shall be at once an effective training-school for studious men and an infirmary for the treatment of mental apathy."

However, I believe that students of pharmacy, as a class, will compare favorably with other college students. The great majority attend school to learn, even if their ambitions are too easily satisfied. Students who seek social advantages, or who are interested chiefly in athletics, or whose sole aim is to have "a good time" are not likely to select the schools of pharmacy. With the increasing requirements for entrance, a further improvement in the *morale* of the student body may be confidently expected.

Thanks largely to the growing appreciation by educators generally, of the advantages of concrete methods over the memory-cramming system which has so long held sway in our elementary schools, I believe that our students are better fitted now than formerly, to appreciate the advantages afforded by the

laboratory and are less likely to consider its work as made up of "stunts" which have little connection with the general course.

And,—to return to our subject,—from which method of instruction, lectures or laboratory-practise, does the student benefit most? I answer, it depends on the teacher and on the student. But, in general, I think you will agree with me, that lectures which most closely approach the laboratory method, namely those which freely employ demonstration and experiment, are the most efficient, while laboratory-practise which shares some of the lecture methods, if indeed it does not directly accompany or follow a lecture, gives also the best results.

To my mind, the ideal plan is the combination of lectures, recitations and laboratory-practise associated together in each subject and with the teacher allowed much latitude in the assignment of the relative number of hours devoted to each of these means of instruction. I believe that when the present minimum course adopted by our syllabus committee is increased, the hours added should be very largely given to laboratory-practise.

And let us keep in mind the changed conditions now confronting students of pharmacy and anticipate, as we can, the further changes which are near at hand. As Professor Mann has put it aptly, concerning the student in another branch of education, "It is no longer, What does he know?—but, What can he do? No longer, How much can he reproduce?—but, How well can he produce?"

University of Illinois School of Pharmacy.

THE COMPARATIVE ADVANTAGES OF PRACTICAL EXPERIENCE AND GENERAL EDUCATION AS A PRE-REQUISITE OF INSTRUCTION IN A SCHOOL OF PHARMACY.

DR. HENRY H. RUSBY.

If the pharmacist were a machine, possessing no other intelligence than that which represented the maker, and doing his work as a result of having been wound up and set going, it would appear desirable to leave out of his construction every unnecessary cog and rivet, lever and spring, so that he would do nothing else than go through the motions for which he was constructed, and would know nothing about what he was doing or why he was doing it. To approach, as nearly as it is possible for a human being to do, to this condition appears to be the conception of the pharmacist's duty which is entertained by a large number of persons connected with the calling. Being a human soul, the real duty of the pharmacist would appear to be to escape just as far from the state suggested, as is consistent with his professional work. The thoughtful person will not fail to recall, that, even in the performance of his ordinary duties, the pharmacist is as often called upon to meet emergencies, and to be thrown upon the resources of his individual intelligence, as are most other members of the community. He will best do this, whose ideas and whose judgment have been the most broadened, and whose intellect has been the most developed;

strictly professional knowledge and skill being not considered. My claim, therefore, as to the value and importance of the preparatory general education of the pharmacy student, is a double one: first, that his professional work is not the *end* of his living, but merely a *means* to the end of that individual development, which he shares with all other members of society, and for the promotion of which he is entitled to a liberal preparatory education. Second, that such a preparatory education is necessary to give him the intellectual capacity that his professional work requires.

On the other hand, practical professional training is indispensable, and the earlier that a student gets it, the better will be his preparation. To attempt to compare the value and importance of these two elements in his preparation, is, therefore, like comparing the relative importance of food and drink in the human diet. Since both are essential, it becomes a question, not of their relative importance, but of the appropriate division of time between them and the most opportune period of its assignment. It must be remembered that there is but one time when the pharmacist can secure any systematic general education, and that is before he begins his professional course of study. From the day of the opening of his pharmacy course, until the day of his professional retirement on a competence, should he be so fortunate, his studies will become more and more narrowly professional. In the first year of his pharmacy course, there will be some latitude in the direction of a broad theoretical foundation for his studies, but in the second, his attention is to be restricted to purely technical matters. As soon as he graduates, the life and death struggle with finance, will begin to absorb him. Having decided then, how much general education he should receive, there appears to be no choice as to the place of its assignment; it must come before he matriculates in the pharmacy school, except for the slight theoretical teaching of the introductory year. Practical training on the other hand begins with matriculation, increases in the second year and becomes the exclusive occupation after graduation.

The question now arises as to the desirability of beginning this practical training earlier and of excising, in its interest, a part of the scanty general education that can come only in the ante-pharmacy period of life. It is frequently said, and truthfully so, that a boy who has a year in a store, before he attends college, makes a better pharmacy student than one who does not. It is equally true that, if he never attended primary, grammar or high school at all, but went to work in the drug store as soon as he was capable of performing any duties, he would do still better with his strictly professional work in the pharmacy school. Indeed, he would probably not have to attend that school at all, in order to be able to pass the ordinary board examination. Now, would that fact constitute a justification for instituting such an arrangement?

As a matter of fact, it makes a boy a still better student and a much better pharmacist, if he can take a year of store work between his first and second years of school work, and this arrangement is far less open to objection than the other. Far better than either, is the plan of combining the two kinds of work in a single course, as is done in our larger cities. Given a sufficiently extended course of study,—which a two-year course is not,—and the alternate days of school work

in store experience, with long vacations devoted also to store experience, is the ideal way for gaining practical experience, and this arrangement entirely eliminates the grounds for demanding practical training before the school course begins.

THE NEED FOR ENFORCING EXISTING LAWS.

BY M. I. WILBERT, PH. D.

If one were to be influenced solely by the evidence presented in the printed proceedings of the state pharmaceutical associations and in the pages of trade-journals one would be justified in the conclusion that the great American mania for law-making is more frequently evidenced in the followers of our craft than in the votaries of any other occupation.

There are, of course, good and sufficient reasons for the periodic interest on the part of members of the drug trade in legislative matters, not the least important of which is the fact, that the drug business offers such a variety of possibilities for the activities of well-meaning but usually poorly-informed reformers; which from a very early period has offered a fruitful field for so-called reform legislation, with all of the inconsistencies and inconveniences that are usually entailed.

It should be remembered though, that many of the existing laws, had their origin with well-meaning, though not always far-seeing members, of the pharmaceutical craft, who were really desirous of accomplishing something of value for the purpose of protecting the interests of the public, and that we of to-day are loath to have their work undone. These early advocates of statutory laws and we, their followers, frequently fail in our legislative program because we lose sight of the essential truth that, without strong public opinion to insist on their enforcement, statute laws are of necessity in-operative.

General arguments, however, are not always convincing and for the purpose in hand it may perhaps be best to restrict the discussion to specific instances.

The Pharmacopœia itself is now so thoroughly well established as an essential feature of the statutes relating to the drug trade, that no argument would appear to be necessary to convince members of our craft that the requirements of the pharmacopœia are *in fact* law and should be lived up to by all members of the trade entrusted with the important duty of controlling the nature and purity of drugs dispensed to the consumer.

In recent years, we have heard many and at times apparently reasonable arguments, in favor of the elimination of that feature of Section 7. of the Food and Drugs Act, which permits of variations from pharmacopœial strength, providing the variation be plainly stated upon the bottle, box or other container. The need for, or even the desirability of, such a change is open to question, when one considers that food and drugs laws are now generally well-recognized as being measures to compel commercial honesty and, strictly and impartially enforced along the lines suggested in recent court decisions, these laws will go

far toward accomplishing even more good than was expected of them by their original promoters. The enforcement of these laws, however, must be consistent and include the practices in all branches of the trade.

The futility of amending Section 7., referred to above, at the present time, without first adequately safeguarding the very foundation of the drug business, *the final distribution to the consumer*, will be apparent when one considers the reports of officials entrusted with the enforcement of pure drugs laws and of laws designed to regulate weights and measures.

The reports from the former sources are fairly well reflected in recent numbers of Hygienic Laboratory Bulletins containing the compilations entitled, "Digest of Comments on the Pharmacopœia and National Formulary." A recent compilation of some of this data (Public Health Reports, 1914, v. 29, p. 1137) shows that of 10,524 samples of twenty-six official articles reported on, no less than 3,288 or thirty-one and two-tenths per cent. were not in compliance with the official requirements.

The one important factor in the non-compliance of these articles, is carelessness, criminal carelessness, on the part of persons entrusted by law to dispense medicines to the consumer.

How fundamentally careless retail druggists really are becomes evident when we learn that in a comparatively recent report from the State of Kansas, it was stated that nearly one-half of the prescription weights examined were condemned and that of 718 prescription scales examined, 195 were found to be unfit for use.

In an address before the National Conference on Weights and Measures, held at Washington, in 1914, F. P. Downing, the Chief Inspector of Weights and Measures, asserted that the coin-weights used in the delicate weighing-apparatus in drug stores, were often found to be ten to thirty per cent. light, and that, in a recent inspection in the city of Milwaukee, twenty-two and one-tenth per cent. of dispensing scales and forty-three and six-tenths per cent. of the dispensing weights in use were found in error.

An even more serious arraignment of dispensing store practices, is contained in a report by George B. Taylor to the Louisiana Board of Health. A prescription calling for two grains of boric acid and two ounces of distilled water was filled by sixty-eight New Orleans druggists. Of these only twenty-two, or thirty-two and three-tenths per cent. were correct both as to distilled water and to weight; considerable allowance being given in weight. Seventeen, or twenty-five per cent., were correct as to weight, but not as to the use of distilled water; fourteen, or twenty-six and six-tenths per cent. were correct as to the use of distilled water but incorrect in weight and fifteen, or twenty-two and one-tenth per cent. were incorrect both as to the use of distilled water and as to weight.

These instances could, of course, be duplicated many times over, but enough has been said to emphasize the point I desire to make, that a very marked improvement, in the nature of the control exercised in the distribution of drugs to the consumer, should be made, and must be made, if the pharmacopœia is to be continued as a recognized book of standards. It goes without saying that, quite regardless of the purity or kind of drugs purchased or sold by the manufacturer, unless they are adequately controlled and accurately dispensed, the consumer cannot possibly derive any benefit from the laws designed to compel

commercial honesty so far as drug products are concerned. The second point I wish to make, is the need for enforcing existing laws designed to restrict the sale and use of poisons. This need is being emphasized in connection with corrosive mercuric chloride, particularly the tablets of this substance which have had more than their share of attention during the past year. For a period of nearly a year, persons in touch with newspaper work took it upon themselves to institute an altogether unwarranted agitation for legislation to prevent something that in reality did not exist.

In not a few instances, even pharmacists were carried away with the newspaper clatter for specific legislation to control the sale of so-called "antiseptic tablets," apparently quite oblivious of the fact that they, themselves, were constantly violating existing statute laws that, in themselves, would be quite sufficient to control the traffic if *honestly* enforced. Practically, all of the existing poison-laws, either directly or by inference, require that the seller satisfy himself above all, that the article is to be used for a legitimate purpose. It is generally recognized, that a very large proportion of the so-called "antiseptic tablets" sold in this country, are not used and are not designed to be used, for legitimate purposes and to this extent the drug trade of the country has been negligent of its duty in safeguarding the best interests of the public. Apart, however, from this particular phase of the subject, it is interesting to learn that the agitation for safeguarding the sale of tablets of corrosive mercuric chloride, because of possible accidental poisoning was, and still is, absolutely unwarranted. Unfortunately, reliable statistics recording cases of poisoning in this country are not readily available, so that the figures are not as startling as they would be were more complete reports available.

For six months, from October, 1913, to March, 1914, I made an effort to compile, from newspaper-clippings, all of the reported cases of corrosive mercuric chloride poisoning in the city of Washington. This compilation of newspaper-clippings, aggregating several hundred, some of them long and harrowing accounts of meaningless details, when analyzed, show a total of twenty-one cases, five males and sixteen females. Of the five males, two fatal cases were acknowledged suicides, one non-fatal case was uncertain and two children, both under two years of age, were found playing with tablets of corrosive mercuric chloride but had probably not taken any of the drug, certainly not a sufficient amount to injure them in any way. Of the sixteen females, four cases were fatal and were undoubtedly cases of suicide, nine were not fatal and in three cases the final outcome is unknown but the patients probably recovered. Summing up the intent, as evidenced by the newspaper reports, we find that the six fatal cases of poisoning were intentional or deliberate suicide; ten of the remaining cases had evidently taken the poison with suicidal intent and in three cases, including the two cases of supposed poisoning in children, the ingestion, if ingestion there was, was due to rank carelessness on the part of some other person and in two additional cases the intent was not apparent, or, as seemed more probable, the cases themselves were "faked" either by the patients or the newspaper reporters.

Somewhat more illuminating data can be obtained from a comparative study of the annual report of the Registrar-General for England and Wales. This

report for 1911 was for a total of 36,070,492 people and the specific cases of poisoning from corrosive mercuric chloride in that year, included five suicides and two cases of accidental poisoning. The report for 1912, just published, includes ten suicides and three cases of accidental poisoning.

The comparative effect of newspaper notoriety on the use of a substance for suicidal purposes, is well shown by a compilation from the annual reports by the coroner of the city of St. Louis, secured by Mr. Francis Hemm, who has kindly furnished the figures. The annual report covers the period from April 1st to March 31st, 1913-1914, which includes practically the time during which much of the unwarranted publicity was given to cases of poisoning by corrosive mercuric chloride in the newspapers of this country. Taking the figures for five years we find that the number of cases of accidental poisoning from the use of corrosive mercuric chloride in St. Louis, a city of 687,027 people in 1910, were three, viz.:— 1910, 0; 1911, 1; 1912, 1; 1913, 1; 1914, 0. The number of suicides from the use of corrosive mercuric chloride during the same period was twenty-one, viz.:— 1910, 1; 1911, 1; 1912, 4; 1913, 3; 1914, 12. It will be seen that the marked increase during the years 1913-1914, is out of all proportion to wnat might have been expected normally, and plainly shows the suggestive effect of newspaper publicity. Compared with the population of England and Wales, the rate reported in St. Louis would aggregate a total of more than 600 cases of poisoning from corrosive mercuric chloride alone.

In connection with the corrosive sublimate agitation, we, as pharmacists, are doubly to blame, first, in not living up to existing laws or in not compelling our competitors to comply with the law, and, secondly, in not directing the attention of newspapers, in language sufficiently convincing, to the fact that suggestive material in the way of details regarding the use of a poison or of any other agency for the destruction of human life, is unwarranted publicity, and, at best, offers an unnecessary incentive to the morbidly inclined to use the suggested method of self-destruction.

Finally, a word on narcotic legislation and the tremendous misuse and abuse of drugs of this kind. Practically every State in the Union at the present time has on its statute books a reasonably efficient anti-narcotic law which if it were not such an absolutely dead-letter would serve to effectually control the sale and use of drugs of this kind.

As members of the drug trade, we cannot effectually hide behind the frequently made statement, that the distribution of drugs of this type to the consumer, is by peddlers or irresponsible dealers. While this may be true to a considerable extent, so far as the final distribution is concerned, it is safe to say that, at some one stage, all of the material sold in this country for use by *habitues* is obtained and obtainable from otherwise respectable and responsible members of the trade who are just not sufficiently alive, morally, to be strictly law-abiding.

The recently enacted Harrison anti-narcotic measure, should serve to furnish the information necessary to make existing statutes operative, and will, at all events, serve to place us, as members of the drug trade, on record as we have never been placed on record before, as to how far we are really in earnest in our efforts to restrict the sale and use of narcotic drugs.

I think I have said enough to show that existing laws, relating to the practice of pharmacy in its wider scope, are not being enforced as they should be, and that we as pharmacists owe it to ourselves, and to the communities that have entrusted us with certain responsibilities to eliminate many of the existing abuses.

We must, above all, realize that existing pharmacy laws place all who are registered in accordance with their provisions, on an equal footing, so that we, individually and collectively, must share any discredit to our occupation from the illegal practices of registered pharmacists. The people at large, rightfully look to the law for protection and if we, as beneficiaries under a law, allow others to impose on and to take advantage of persons who rightfully look to us for protection, we are in fact responsible, quite regardless of whether we ourselves are the transgressors or allow our competitors to continue their illegal practices unchallenged.

In conclusion I beg to make the one plea that we, individually and collectively, make an honest and an earnest effort to disabuse our own minds and also the minds of our fellow citizens, of the notion that all existing wrongs can be corrected by the enactment of suitable laws. Let us develop the necessary courage to call attention unflinchingly, to existing abuses and let us insist that, whenever possible, the laws now on our statute books be enforced; that such as cannot be enforced be repealed, and that, in all future-agitations for new legislation, the best interests of the people at large only be considered as the governing incentive.

ENFORCEMENT OF DRUG LAWS.

BY FRANK R. ELDRED.

The effect of a law is altogether dependent upon its enforcement and the construction placed upon it. It is a matter of common observation that the objects of the law maker may be partially or entirely defeated by the method of administration. While there has been a very general discussion in regard to drug laws, the discussion of their enforcement has been confined largely to the officials to whom this work is entrusted. The enforcement of these laws, since the enactment of the Food and Drugs Act of 1906, has resulted in great benefit to the public; no class has profited more than honest drug manufacturers and dealers, and the entire drug trade has been placed upon a sounder foundation. As in every new undertaking, mistakes have been made and it has been necessary to learn by experience; the result has been a rapid improvement in the manner of enforcing the laws. The good accomplished has justified the methods which have been employed, but we have now advanced so far and conditions are so satisfactory, that it is time to enquire thoroughly into the possibilities of further improvement, for while it is important that drug laws should be standardized, it is no less important that the methods used in their enforcement should be standardized. In order to obtain a clear view of the situation, which is necessary before such improvements can be effected, it is necessary to approach the subject

from different angles. The present discussion is from the view-point of the manufacturer.

The first principle to be established, is that the laws were originally designed to protect the entire public, and not one class as opposed to another; only, as one necessary means for accomplishing this, did they provide for the punishment of law violators. In order to protect all classes, the drug dealers, wholesale and retail, and the drug manufacturers, must not be discriminated against and in assisting and instructing them in their efforts to serve the general public, officials can accomplish more than in any other way. The penalty should be reserved for intentional or persistent law violators. It is gratifying to note that this principle is being recognized in some of the states, and that the officials are publishing bulletins of information for the drug trade and for the consumer. Although the prime object of the law, was to protect the public, it has sometimes happened the prime object of the drug-official has been to punish the offender. Such officials have not yet learned the important lesson that most manufacturers and dealers are honest and intelligent, and are anxious to coöperate with them in protecting the public from impure or sub-standard drugs.

Another way in which the objects of certain laws have been perverted, is by arbitrary regulations or standards, which have been promulgated by officials charged with the enforcement of the law. These rulings are too often based upon a technical construction of the law, without due consideration of their effect upon the public.

It can thus be seen that, however excellent the laws may be, their power for good is dependent upon those who enforce them. It is, in some respects, unfortunate that laws relating to foods and drugs are, in most cases, administered by the same officials. When the Federal Food and Drugs Act, which is to a certain extent a model for the state laws, was passed, there were many men qualified as analysts of agricultural and food products, and this class of work had already received general recognition on account of the work of the agricultural experiment stations. Pharmaceutical chemists were few, and their work not generally known, therefore, with very few exceptions, the food chemist was called upon to administer the food and drug laws. The average food chemist, with drug work thus thrust upon him, found that, added to his inexperience in this line of work, the analysis of drugs was much more difficult than the analysis of food products. He was unfamiliar with the literature of pharmacy and disappointed, because drug analysis was not and could not well be treated, within the covers of a single volume, as in the case of food analysis. When chemists in charge of food and drug laboratories, endeavored to employ competent drug analysts, they found that this field of chemistry was practically unoccupied, and they were forced to employ as drug chemists, men without pharmaceutical training or experience. This condition resulted, at first, in the examination of certain drugs whose strength could be easily determined and, in order to make as great an impression as possible in the drug work, those which were known to deteriorate rapidly were usually selected. When this class of drugs was exhausted, attention was then turned to those which required more skill upon the part of the analyst. Under the circumstances, this was probably the best procedure that

could be adopted, but it has led to some unfortunate results which will be pointed out later.

Bearing in mind this general discussion of the situation, let us examine in more detail, the procedure now followed in enforcing these laws. The first step to be considered is the collection of samples for examination. An important regulation under the Federal law, requiring three samples to be taken, one of which is available to the seller, has not been adopted by many of the States. The Federal law, also, requires a preliminary hearing for the alleged violator of the law, while some of the State laws do not provide for such a hearing. As the State laws differ among themselves, as well as from the Federal law, and as the methods adopted for the enforcement of the laws, differ even more than the laws themselves, no general statement can apply in all cases, and, in pointing out the abuses which exist, it must be recognized that these abuses are far from universal; in fact, most of the suggested reforms are already in effect in one locality or another. In those states where law does not provide for the collection of more than one sample of each product, the seller has no recourse in case of an error in analysis, indeed the samples taken are frequently too small to allow the chemist in the state laboratory to confirm his own results by a second analysis. It is usual in such cases for the state chemist to maintain his position; neither he, himself, or any one else can establish proof of the error, for there is no official sample left, and the statement of the seller, that any subsequent sample, which he may supply, is from the same stock as that obtained by the inspector, is usually discredited. In fact, the long delay in publishing or prosecuting such cases frequently makes it impossible for him to supply another sample from the same lot of goods.

The selection of products to be investigated, is of importance, and this has too often been decided by the ease of analysis and the probability of finding substandard goods, rather than by the importance of the product to the community. It was known that precipitated sulphur frequently contained calcium sulphate as an impurity, and although this product was of no practical importance, it became a favorite subject for examination. Drugs known to deteriorate rapidly, have also been much more frequently selected than drugs known to be stable. While it is conceded that these drugs should be pure and of full strength, time has often been devoted to them which should have been given to more important drugs. Because of this manner of selecting products for examination, statistics in regard to the percentage of adulterated drugs on the market, which have been compiled in the various states, give an entirely erroneous idea of the extent of drug adulteration. These statistics are also misleading on account of the use of the terms "illegal" and "adulterated," when only a slight variation from the legal standard exists, or even when an error has been made by the official chemist. The figures thus obtained are heralded by newspapers and other agencies, until a false idea of the entire drug trade is created in the public mind.

The collection of the sample, is followed by its examination in the laboratory, and it is here that the standard by which it is judged and the method of analysis, become matters of vital importance. Some of the standards are established by the Pharmacopœia, others are published in the form of regulations for the enforcement of the law, while still others exist only in the mind of the chemist

in charge of the work. If the standard is established by the Pharmacopœia, it has had the sanction of a committee chosen from recognized authorities on the subject, but the regulations are often framed by persons having no practical knowledge of the matter which they attempt to regulate. Manufacturers may have studied for years the preparation of a product which will best serve their trade, and such a regulation may force them to forego all the advantages derived from their study and to supply a product which is not what the trade demands, or to increase the price without a corresponding increase in value. There are instances where it has even been necessary to lower the quality, in order to comply with the regulation. The unwritten standards are usually arbitrary and represent purely personal opinions, some are supplementary to published standards and others are not based upon any such standard. They exist for the case in hand, and while they are not made the basis of legal action, it must be remembered that publicity may do more damage to a seller than a legal penalty.

The Pharmacopœia also establishes many methods of analysis, but where an official method is not available, some other method is arbitrarily selected, usually without a thorough investigation of its accuracy. The inconsistency has been observed of recognizing the need for coöperative work to determine the accuracy of a method, and, at the same time, using results obtained by it as a basis for prosecuting a manufacturer. Moreover, many recognized methods will give accurate results only when the chemist employing them has had long experience in their use and this is particularly true of the methods used in drug assaying. The difficulty of obtaining competent drug chemists has already been noted and it is therefore not uncommon to find erroneous results reported by state laboratories.

After the analysis has been made and the product is measured by the standard, it frequently happens that legal proceedings are not instituted, but the results are published in one way or another. Even though the manufacturer or dealer may have been entirely in the right, he has in this case no recourse, for any suit which he might bring to force a retraction, would only place him in the light of opposing the enforcement of the drug laws and he is usually handicapped also by having no official sample. The only hope of the seller, is that the official who has occasioned the undesirable notoriety will voluntarily correct his statements, even though this involves considerable embarrassment to himself. Publicity in such cases is deplorable, as also in cases of unintentional or technical violations of the law. It has been suggested, by certain malicious individuals, that agitation and publicity of this kind are necessary to justify the office and show the efficiency of the officer, but if any drug official ever shared this idea, experience quickly dispelled it, as the most successful officials are those who recognize the need for constructive work. It is difficult to see how publicity of this kind can be of service to the public, for it places the seller who may have committed no offense, or only an unintentional or technical one, in the same light as the dishonest or persistent violator of the law and thus affords no opportunity to guard against the latter class.

This discussion of drug law enforcement, is based upon specific cases which have come under the observation of the writer, and in order to illustrate what

has been said, a few of these cases will be presented, omitting, for obvious reasons, names and localities.

Several druggists received notice that the Tincture of Digitalis purchased from them was below standard. The manufacturer was also notified that his product was below standard but not where it had been obtained, this information, however, was given upon request. Further inquiry brought out the fact that the "standard" referred to was an extractive-standard which had been arrived at by making several tinctures by the U. S. P. process and taking the average of the total solids as a standard. It is needless to point out to any one familiar with the great variations in strength of digitalis that this unpublished standard was absurd and moreover, it had no legal standing in the state. The tinctures which were declared to be below standard, had been standardized physiologically and, as nearly as could be determined by such means, they were uniform in strength and represented ten per cent. of the strength of an active digitalis leaf. Upon calling the official's attention to these facts, he evaded the question as to the propriety of a physiological standard, and refused to modify his statement to the druggists. In the opinion of the writer, this and some of the other cases cited, would furnish just grounds for legal action against officials who thus attack the reputation of a manufacturer and whose only justification is that they do not hold the manufacturer legally responsible, since the original package was broken.

A somewhat similar experience, illustrates also the danger of erroneous analytical results. A number of druggists in a certain section of the country were notified that the Tincture of Belladonna, which had been taken from them, was found to be below standard. After an exchange of several letters, the manufacturer of the preparation learned the names and addresses of the druggists from whom the tincture had been obtained and also that the strength of the various samples was from 42% to 82% of the official requirement. Samples obtained from several of the druggists concerned, were found to be of full strength and upon assaying samples from all lots manufactured during the previous six years, the weakest was only seven per cent. below the U. S. P. standard. These results showed conclusively that errors had been made in the state laboratory, but they maintained the correctness of their assays and refused to send any portion of their samples to the manufacturer, or to give credence to the statements of some of the druggists, that samples supplied to the manufacturer were identical with those taken up by the inspector.

An almost identical experience with Tincture of Opium, could be cited, although it is well known that inexperience in assaying opium preparations is a frequent cause of low results. The same situation was met in a wiser way, by an official who has always recognized the value of conservative and constructive work. All the samples of Tincture of Opium collected, were below standard. Suspecting that this was due to an error on the part of the analyst, the director of the laboratory consulted an experienced drug analyst, and it was found that such was the case. The results were therefore not reported and no injustice was done.

Arbitrary methods of analysis are often stumbling blocks. Only recently it was insisted that 8.8% of water be declared upon a label, although by actual manufacturing data it was known that less than 5% was present.

The interpretation of results is a matter which requires the exercise of good judgment. When several pharmaceutical preparations were classed as "illegal" in a board of health report, it was pointed out to the chemist in charge, that the reported results varied from the official standards by less than the inherent error of the methods and that if a second determination had been made in each case (which had not been done) the result might have been as much above the standard as the first was below. The original statement, however, was never modified, for it was argued that, as the determinations which had been made were below the official requirements although ever so little, the clerks who compiled the statistics must class the products as illegal; thus the injustice to the manufacturers whose names had been published was not corrected. Fortunately, the forthcoming Pharmacopœia will provide against such errors of judgment, by establishing maximum and minimum limits, instead of giving exact figures as standards.

Many more such instances might be cited, as well as instances showing wise and judicious administration of the drug laws, but it is not desired to multiply examples and only one more will be given to show how premature publication of results affects the conscientious official. Two druggists were notified that their Tincture of Nux Vomica was below standard; the manufacturer being also notified at the same time. Samples were obtained from the druggists, assayed by the manufacturer and found to be of standard strength. This fact was communicated to the drug official with a request for portions of his samples, the request was granted and they were found to be of standard strength, the mistake was acknowledged and rectified by letters to the druggists.

These criticisms and examples have been given only for the purpose of justifying the suggestions which are to be offered. The basis of any plan for the enforcement of the drug laws should be coöperation between drug officials and all branches of the drug trade. In the first place, products should be selected for examination on account of their power for good or evil to the community. Three samples should be taken and sealed in the presence of the inspector and dealer, one should be kept by the dealer, one used for examination and the third filed for use in case of a disagreement. If the law does not provide for duplicate or triplicate samples, then the druggist or manufacturer should insist on keeping a sample which has been sealed by the inspector, and this should be retained until a report is received from the official in charge of the work. Should the druggist or manufacturer fail to take this precaution he should be requested to do so by the inspector. In case the product is reported below standard, this sample can then be examined by the manufacturer or by a commercial chemist and, if their findings do not agree with those of the official chemist, the triplicate sample, which should be in reserve, can be used in settling the controversy. In any event, after the sample has been examined by the official chemist, his findings, if adverse, should be reported first to the manufacturer of the product. If he can show that the product is of standard quality, of course the report should go no further. Should it appear that only a technical or unintentional violation exists, not due to ignorance or carelessness, it is difficult to see how any good can be accomplished by making the matter public. Of course, honest differences of opinion will arise, but if the manufacturer cannot prove that he is in the right, the drug official can then have recourse to publicity or legal proceedings. After

the matter has been discussed with the manufacturer, the dealer should receive notice of the disposition of the case, and, in fairness to both dealer and manufacturer, notices should also be sent when the drugs examined are found to be of standard strength. This course would unite the honest manufacturers and dealers with the drug officials in their campaign against impure and adulterated drugs and would thus result in a more adequate protection of the public against them.

Much constructive work can be done by the drug officials, with expert assistance which they can easily enlist, in working out proper standards and in establishing accurate methods of analysis. It is needless to say, that both standards and methods should be published, and that intelligent criticism should be encouraged. Bulletins of information for the drug trade and the public, can also be made very valuable and a good start has already been made in this direction by some of the states.

If some such plan of action could receive the support of this and other organizations interested in the enforcement of the drug laws, it would be only a short time until all antagonism between officials and dealers would disappear and everybody concerned would be working harmoniously for the enforcement of these laws.

Scientific Division Eli Lilly & Company, Indianapolis.

A PLEA FOR A HIGHER STANDARD FOR ENTRANCE TO THE PROFESSION OF PHARMACY.

C. B. JORDAN, PH. C., M. S.

We are living in an age of progress in which the arts, sciences, and trades are making rapid advancement. Old methods and standards are inadequate to cope with modern problems. The professions allied to pharmacy, medicine and dentistry, have changed their methods and raised their standards and are giving to the public better service than ever before. It behooves us, the pharmacists of the country, to advance with and keep abreast of this progress or we will lose out and the profession will be seriously injured.

If pharmacy is a profession, the standard for entrance to it should be comparable to the present-day standards for entrance to the other professions. But is pharmacy a profession? I am ashamed to say that this question is asked in all seriousness by the pharmacists themselves. A short time ago, a series of articles appeared in Merck's Report in which this question was viewed from all standpoints by the pharmacists of the United States and some men who are prominent in pharmacy to-day declared that it is not a profession but a commercial business. Careful consideration of these articles, showed clearly that pharmacy will be what we pharmacists desire to make it. If we wish, we can make it a commercial proposition, or we can make it a dignified profession.

What are some of the things that should be done to make it a dignified profession? First, and most important, we must raise the standard for entrance to the profession.

Our standard to-day is very low. To prove this, I have only to cite the fact, that some of our state legislatures have seriously considered such bills as the one to register, without examination, all persons who have been connected with a drug store for ten years, be it in the capacity of porter, errand-boy, or soda-fountain tender.

We were all highly indignant when a New York judge declared that pharmacists are a class of men with little learning. This, however, shows us how people outside of the profession view us. When we stop to consider that in many of our states, a man can become a full-registered pharmacist by serving a four-year apprenticeship, which may mean selling patent medicine and kodaks for four years, and passing an examination so easy that he can prepare for it by taking a three months' "quiz-compend-cram" course in one of our so-called schools of pharmacy, we must concede that they are, in a measure, justified in taking such a view of us. Men in the other professions, the lawyer, engineer, doctor, dentist, chemist, and even the agriculturist, look upon our profession as an inferior one, because it requires so little preparation to enter it.

Ten years ago, the profession of medicine was in a rut. Little or no standard was maintained in many states, and we suffered from an over-production of incompetent and poorly-trained physicians and the public had little confidence in the profession. By the combined efforts of the physicians and their boards of medical registration, all this has been changed. Standards have been raised and maintained, so that to-day, in many states, a person must complete a six year college course and pass a rigid examination, before he is allowed to practice and, in a short time, he will be compelled, in addition, to spend one year in hospital work. This elevation of standard has accomplished wonders for the profession and to-day we have fewer but better physicians and the public is better served. Pharmacy is to-day, where medicine was ten years ago and an elevation in our standard will do for pharmacy what it has done for medicine.

The standards for entrance to the trades, have been raised with a like result. To illustrate, a plumber must serve four years apprenticeship, and does not receive full wage until the end of six years. The pharmacist serves a four-year apprenticeship which may mean four years behind a soda fountain and then takes an examination that he can prepare for by taking a three months' "cram-course." Plumbing is a trade, while pharmacy is a profession, and the only difference in preparation, is that the pharmacist must take this easy examination. I am speaking now of the standards obtaining in many of our western and middle-western states. I know that some states have higher requirements, and, as a result, the pharmacists in these states enjoy a much better professional business.

As a result of our low standard, we have a great army of poorly-trained men, causing fierce competition, low wages, long hours, the commercialization of the profession, and lack of public confidence. There is hardly a city, village or hamlet in the United States, that does not contain two or three times as many

drug stores as are necessary, to carry on the legitimate drug business of the community. This fierce competition causes the druggist to add side-line after side-line, until it is difficult, in some cases, to distinguish the drug store from the notion shop. It also causes the druggist to pay his clerks low wages and to work himself and his clerks long hours, in order to make a living.

Fierce competition demands cheap help, cheap help demands low standards, low standards cause overcrowding of the profession, and overcrowding causes fierce competition. Thus we have a complete cycle of cause and effect. If we attempt to break the chain at any point, we are told that we will disturb trade conditions. What if we do disturb trade conditions? You cannot remove a cancer without causing the patient pain. An uplifting of standards will not debar any one who is already registered, and the effect upon trade conditions will be so gradual that any one who is failing, will have time to adjust his affairs and enter another field.

Our low standards permit many undesirables to enter the profession, men who have no respect or regard for it, but who adopt it for the purpose of private gain. The "boose and dope" seller can easily qualify, and conduct a "saloon or dope joint" under the guise of a drug business and thus bring the legitimate pharmacist into disrepute. Only a short time ago, a saloon-keeper applied for membership in one of our state pharmaceutical associations, believing that, since he was pretending to conduct a drug business, he was eligible for membership.

The profession of pharmacy is not very attractive to our best prepared young men, because of the small compensation received by the drug-clerk. The shoe-clerk and the grocer-clerk receive as much compensation and have much shorter hours, with no educational qualifications for entrance. A young man who has completed a high-school course, and who is trying to decide what profession to enter, usually steers clear of pharmacy. A great many men who are in the profession, are dissatisfied with it and do not encourage their friends who are well-prepared to enter it. I have heard men who are pharmacists, declare that they would never let their sons enter the profession. Under these conditions, we cannot hope to recruit the profession from the ranks of the best-prepared young men.

There is a demand to-day, more than ever before, for well-trained pharmacists. The younger physicians are asking for careful urinary analysis, the incubation, isolation and determination of bacteria, the determination of the bacterial content of the secretions of the body, etc., all of which require skilful laboratory workers. I am sorry to see that, in some places, this work, instead of going to the pharmacist where it belongs, is going to the younger physicians because they are better prepared for it.

Our medical colleges are laying much stress upon bacterial diagnosis and upon the use of biological products, in the treatment of diseases. The pharmacist should be prepared to assist the physician in this work. To be prepared for this, a person should have a good college course of four years or more. What incentive is there for a young man to secure this preparation and become registered as a pharmacist when he is placed on a par, in the eyes of the law, with the man

who has sold patent medicines and kodaks for four years and has taken a short "cram-course" in pharmacy?

I have shown that our low standard causes overcrowding of the profession. fierce competition, low wages, poorly-trained and incompetent pharmacists, and lack of public confidence. Therefore I believe that the hope of the profession lies in an elevation of standard for entrance to it.

I would respectfully urge that the Association inaugurates a campaign to secure a higher standard for entrance to our profession.

SIMPLE METHOD FOR DETERMINING GLUCOSE IN DIABETIC URINE AND OTHER LIQUIDS.

Ten mils of the urine is measured into a 200-mil flask, and water added to make 200 mils. A solution of potassium carbonate (2 oz. to 6 oz. of distilled water) is filtered and made up to 8 fl. oz. To 20 mils of the diluted urine, 10 mils of the potassium carbonate solution is added in a small flask, the mixture boiled carefully for three minutes, cooled, and made up to 50 or 100 mils with distilled water. A solution of pure glucose is prepared, 1 Gm. in 200 mils of distilled water; 20 mils of this and 10 mils of the potassium carbonate solution are boiled together in a small flask for three minutes, cooled, and made up to 50 or 100 mils. The two solutions are then compared by holding the glass tubes over a piece of white paper at an angle of 45°. By pouring the liquid from the known solution into a measure glass until the tints of both are alike, and observing the amount of the known glucose solution used, the percentage can readily be determined; for example, if 27 mils of the pure glucose solution were required for the solution, then, multiplying by 2 we obtain 5.4 as the percentage of glucose in the urine.—A. F. Dimmock, M. D. (Brit. Med. Journ., August 29, 1914, 399).

THE MOST POWERFUL MAGNET.

Probably the strongest electro-magnet is produced on the new method which Professors Perot and Deslandres are applying with success. Their idea is to take one of the strong electro-magnets of laboratory type with pointed pole-pieces which already give a high value of the magnetic field, and then to put an extra coil around the air-gap between the poles so as to add considerable to the field. Such coil is made of thin copper strip and is cooled down as low as -30 degrees C. by a current of oil, so that a remarkably heavy current can be put into the coil without burning it; for instance, it will stand a current density of 1800 amperes per square millimetre, using a 0.2 millimetre strip. Such a coil is put on a Weiss electro-magnet which carries the usual coils, and gives 41,000 gauss for the magnetic field strength. Putting on the 30,000 ampere-turns of the new coil, this brought the field strength up to 51,000 gauss, and it was only lack of current supply that prevented running as high as probably 60,000 gauss, so that a most powerful field can be thus obtained.—*Boston Transcript.*

Editorial

ERNEST C. MARSHALL, Acting Editor..... .....63 Clinton Building, Columbus, Ohio

PATIENCE AND "PEARSON'S."

THERE is no human quality so useful as Patience under misrepresentation; a tolerance which endures; a serenity of mind which allows oneself to be maligned; which, confident of strength sees petty natures lie and injure without a word of protest or one thought of dismay. Sanco Panza tells us, "Patience and shuffle the cards." And we should have been patient under the criticism of the profession which recently appeared in a fourth-rate magazine, rather than to have encouraged and stimulated their untrue attack by striving to show them that they were wrong. They knew they were wrong, that they were misrepresenting matters, but they simply wished to bring a dying venture into the lime-light, to acquire notoriety. Did they care that what they said was untrue? Not at all. Did they care what injury they might do by their false misrepresentation? Did they care that they maligned a body of men whose services to humanity and to every community are second to none? They cared not for this. And the only answer to such criticism is a dignified silence. You please a blackguard, when you notice him. To reply to him is as unwise as for a gentleman to answer the gibes and jeers of a boozy corner-bully.

"It don't pay to do much talkin'
When you're mad enough to choke,
For the word that stings the deepest
Is the word that's never spoke.

"Let the other feller do the talkin'
Till the clouds are cleared away,
Then he'll do a heap er thinkin'
'Bout the things you didn't say."

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DRUG IMPORTATIONS.

IN view of the testimony recently given by Mr. Harry B. French, President of the Smith, Kline and French Company of Philadelphia, before the Committee on Uniform Food and Drug Regulations of the Chamber of Commerce of the United States, it is evident that it is exceedingly difficult for Government officials at different ports, however honest their intention, to pass judgment upon drug importations and arrive at the same conclusions.

Mr. French testified that:—

"If the Government makes a statement that the goods will not be released because of certain allegations on the part of the Government, these allegations are made to the importer and he is given an opportunity to appear before the collector of the port of entry and present arguments. The samples and arguments are then sent to Washington, and if the Washington officials uphold the local officials, the importer has no alternative but to re-export the goods. The tendency at Washington is invariably to support the reports received from the authorities of the different ports, and the reports vary with the numbers of ports.

"For example: (1) We imported Asafetida. Its solubility test was 40 per cent. It was rejected at Philadelphia. The goods were re-exported to London. We then bought Asafetida in New York. It tested only 30 per cent. solubility and we so labelled it. The goods were seized by the U. S. officials, but the Courts decided that the goods were legally our property because they were properly marked: (2) We imported Myrrh through New York. The Collector of the Port refused to pass the drug on the grounds that it contained too much ash

and did not answer the U. S. P. description. The Pharmacopœia gives no standard for ash. The Government officials suspected the presence of foreign gum. They did not assert that they could show its presence, but they refused the admission on suspicion, and their stand was upheld by the Washington authorities. An independent examination by one of the leading experts of the country showed the entire absence of foreign gum; (3) We imported Saffron through Philadelphia. It was refused admittance on the ground that it contained too much moisture, ash and sugar. Saffron is not official in the present U. S. P. (VIII) but the next edition of the U. S. P. (IX) will permit 7.5 per cent. of ash. The content of ash in the Saffron was less than that allowed by the new Pharmacopœia. There is, of course, no moisture-standard in the U. S. P. (VIII), but the next edition of the U. S. P. (IX) will permit 14 per cent. The Saffron rejected contained a slightly larger percentage of moisture than the standard to be, but this could have been readily removed by drying before admission (as it was later). As regards the sugar, it can be said that all Saffron contains sugar, and the quantity present was less than the standard. Other instances of abuses in drug importations can be cited."

According to Mr. French, the following abuses are possible:—

"The same quality of drug may be brought to five different ports. At one port the drug may be permitted entry without examination; at another port the drug may be examined and admission granted; at the third port the drug may be examined and refused admission on grounds which have a legal basis; at the fourth port importation may be refused because of suspicions on the part of executive officials and for reasons that are not legal, and at the fifth port the drug may be examined and delivery made on conditions that the goods are marked in a certain manner."

Drugs imported into the United States must comply with the provisions of the Drugs and Medicine Act of 1848 and the provisions of the Food and Drugs Act of June 30, 1906. These two acts are held by the Attorney General to be cumulative. Decisions whether drugs shall be admitted in the United States rest with the administrative officers of the Government. Neither act provides for a review by the courts of such decisions. Under Section 11 of the Food and Drug Act, importers are privileged to appeal to the Secretary of Agriculture and submit testimony, but such appeals are usually made or referred to the Bureau of Chemistry (which may have prejudged the case), and are then passed upon by the Secretary of Agriculture, whose decision is final.

In a letter to Hon. F. M. Simmons, Chairman of the Finance Commitee of the U. S. Senate, Secretary Houston, of the U. S. Department of Agriculture, writes:

"It is true, as stated by Smith, Kline & French Co., that there have been differences in the findings of the Department's chemists at different ports of entry with respect to crude drugs. The number of samples of imported food and drugs examined since the Food and Drugs Act became effective, January 1, 1907, has been enormous. It has been impossible to avoid differences in results of analyses made by different chemists at the same or different ports. The Department, however, has endeavored to be fair and consistent in its rulings. When differences in analyses have been noted, or the results of the analyses have been questioned by importers, such analyses have been made before arriving at decisions. It is believed that as a result of the experience of the Department, fewer differences in analyses occur now than formerly, but in view of the large number of samples of imported food and drugs required to be examined, it is to be anticipated that there will be some differences in the findings of the chemists in the future."

And it is these differences that should be corrected. The methods of examining imported drugs at the ports of entry should be standardized, as suggested by the Drug Trade Section of the New York Board of Trade and Transportation,

and the conditions of entry made as uniform as possible at all ports. The "personal equation" factor should be eliminated. Rejections should be based on demonstrable facts and not on suspicions.

It must be borne in mind that customs officials exercise the power of passing importations without examination; that it is within their power to give legal reasons for the rejection of an importation, which objections, however, may not have been founded on fact, and yet the importer has no legal redress. It is manifest that such a system gives a large scope for the use of personal influence, and offers the possibility of gratifying private grudges. It is not asserted or intimated that any of the officials of the ports of this country are guilty of such nefarious practice, but it is certain that the system encourages such practice. Russia is the only great civilized country in the world that has a bureaucratic government and the power of Russian officials to send citizens to Siberia, without trial, should not commend the system to American citizens.

Importers of drugs should be given the right of judicial appeal when a refusal of delivery of goods is made by the Treasury Department, a right accorded by law to importers in the assessment of goods for duty under the Tariff Act.

It may be argued that it would not be expedient to give importers the right of appeal to the courts upon matters of a scientific or technical character—that such questions should be determined only by Government officials trained in the work. But Government officials are human and naturally sustain the findings of each other. Whoever heard of a Government official in any department failing to sustain the scientific or technical report of a fellow official?

As to the lack of scientific or technical training by the Court, the latter could readily appoint a scientific or technical referee (as it does other referees) who could take testimony and report upon the facts to the Court, when an impartial decision could be rendered.

Section 11 of the Food and Drugs Act should be amended to provide for appeals to the courts from decisions of the Secretary of Agriculture in the matter of *both* food and drug importations, and it should be entirely possible to do this, and also, "adequately safe-guard the admission into the United States of only such foods and drugs as are not adulterated or misbranded or otherwise in violation of the Act."

The great principle involved in the demand for an amendment of the Act is that American citizens should not be deprived of their constitutional rights and their business placed at the mercy of executive officials without the power of judicial appeal.

J. W. ENGLAND.

THE HARRISON BILL.

THIS law has been discussed at such length that it is almost unnecessary to speak of it except to note the fact that *Jacta alea est,* it is now the law of the land, and as such it must be obeyed.

It is certainly very satisfactory that many vexatious and burdensome restrictions have been eliminated from the original bill and, in its present form, it is as unobjectionable as such a bill could well be to the trade. The National Drug Trade Conference has again demonstrated the wisdom of its establishment, for by its wise direction the bill has been wisely amended and much that was mischievous has been eliminated.

The country demanded some law to control what was termed the drug-evil. Exaggerated statements and garbled statistics had engendered the belief that the nation was largely composed of weak-minded people, who must be protected against themselves. Now that this law is passed it may be that those who thought the nation was going straight to "the demnition bow-wows" will be for a time satisfied, will allow it to demonstrate its usefulness, and will cease their striving to impose further restrictions upon an already overburdened profession.

The results of the bill may be salutary. It must be said that the intent of the framer of the bill and of its protagonists is most commendable, but sometimes laws intended to be restrictive fail, because they attempt to do too much.

Lord Chesterfield, in his famous letters to his son, told him that he wished him to frequent the Courts of Europe, principally to see "with what little wit the world was governed." And if this law proves ineffective, it will not disappoint those of us who have seen so many other laws fail in attaining the results which they were intended to accomplish.

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SAN FRANCISCO.

THE attention of the members is called to the advertisement of the World's Fair Company, which appears on Page VII of our advertising pages.

This company has the backing of some of the leading citizens of Columbus, and the inclusive price, which they make for the trip, embraces unusual features for the excursion to the meeting.

The special trains which this company will run will be equipped with moving-picture outfits and it is planned that cabaret artists will accompany every party to relieve the tedium of the long railroad journey.

Full information regarding these many attractive features may be received by writing to Mr. Robert C. Byers, the District Director, at 27-28 Ruggery Building, Columbus, Ohio, and the name of every person so writing will be placed upon a list to receive the latest information in regard to the Fair and the advantages of use of the company's arrangements in going and returning from the meeting.

JAMES HARTLEY BEAL, PHAR. D., SC. D., LL. B.

Professor Beal was born on the twenty-third of September, 1861 near New Philadelphia, Ohio. He received the education of that municipality and during the school-vacations he worked at farming and coal-mining. After leaving school he entered the profession of Pharmacy in Urichsville, Ohio, and afterwards was employed in its active practice in Akron, Ohio.

Filled with the ambition for a college-education he entered Scio College graduating from that institution in 1884, with the degree of Ph. B. He then studied Chemistry and Pharmacy in the University of Michigan, also attending the Law School of that institution. Later he entered the Cincinnati Law School, from which he graduated in 1886. He has never practiced the profession of law, but his studies in that line have been decidedly useful to the profession in the service he has rendered to it in the preparation of many legislative bills and the study of Pharmacy Laws.

In 1895 he received the degree of Doctor of Science *in Curia* from Mount Union College and Phar. D. from the University of Western Pennsylvania. He was Dean of the Department of Pharmacy of Scio College from 1887 until 1908, and was the acting president of that institution from 1902-1904.

His activities in the Association has embraced all fields of its endeavor. He became a member of the Association in 1892. In 1897 he was elected Chairman of the Section on Education and Legislation. He was chosen First Vice President in 1900, and President for the year 1904-5. He was President of the Conference of Pharmaceutical Faculties in 1906-7; President of the Ohio State Pharmaceutical Association in 1898-9; Chairman of the Committee on Uniformity of Legislation, Methods of Analysis and Marking of Food Products at the National Pure Food and Drug Congress in 1898. At the present time he is Chairman of the Board of Trustees of the U. S. P. Convention and a member of the Food and Drug Trades Conference and a member of the Board of Directors of the American Druggist's Fire Insurance Company of Cincinnati, Ohio.

In 1911 he was elected General Secretary of the Association and Editor of the JOURNAL, from which positions he resigned in June of last year. He has contributed largely to pharmaceutical literature and is the author of many books relating to Pharmacy and its coordinate professions, among these works being "The Elements of Pharmacy," "Chemical Arithmetic," "The Era Course in Pharmacy," "Pharmaceutical Interrogations," "Interrogations in Dental Metallurgy," "Equation Writing."

Prof. Beal was a member of the Seventy-fifth General Assembly of Ohio. In his legislative service he was Chairman and member of important committees, and he left upon the statute-books of the state an enduring impress in the Beal Local Option Law, now one of the most effective and wise laws of the State.

For many years Dr. Beal has been interested in the oil and natural gas properties of the Midland region.

In 1886 he espoused Fannie Snyder Young of Urichsville and two children have been born of that union; George Denton Beal, Associate Professor of Chemistry of the University of Illinois, and Nannie Esther Beal. Prof. Beal now resides in Urbana, Ill.

Scientific Section

Papers Presented at the Sixty-Second Annual Convention

THIRD ALKALOID FROM GELSEMIUM.

A. E. STEVENSON AND L. E. SAYRE.

The Proceedings of the American Pharmaceutical Association for a number of years past have recorded the progressive work of the laboratory of the University of Kansas in regard to the alkaloids of Gelsemium.

Last year a report was made on the further study of Gelsemium, giving, in the first place, the percentage of various alkaloidal and acid products from fifty pounds of the crude drug; secondly, a very complete statement as to the physiological action of the alkaloids, Gelsemine and Gelseminine. This latter work was contributed by Doctor F. P. Chillingsworth. It may be said in passing that during the past year, Doctor S. A. Mathews, pharmacologist, has gone over the physiological action of Gelseminine and his results confirm those of Doctor Chillingsworth.

During the past year, two separate lots of Gelsemium, from different sources, have been investigated for alkaloidal constituents. The results of this work, being somewhat noteworthy, we desire to record them in the present Proceedings of this Association.

The first lot of Gelsemium consisted of one pound of the concentrated fluid extract, which assayed .4% of total alkaloids. The second lot consisted of five pounds of powdered gelsemium root, ground especially for investigation.

By a change of a method of procedure, suggested by one of us (Stevenson) we have secured, as a result, a purification of what seems to promise a third alkaloid, which furnishes definite forms of crystals in the alkaloidal condition as well as in two of its salts, namely, the hydrochloride and the nitrate, the only ones thus far studied.

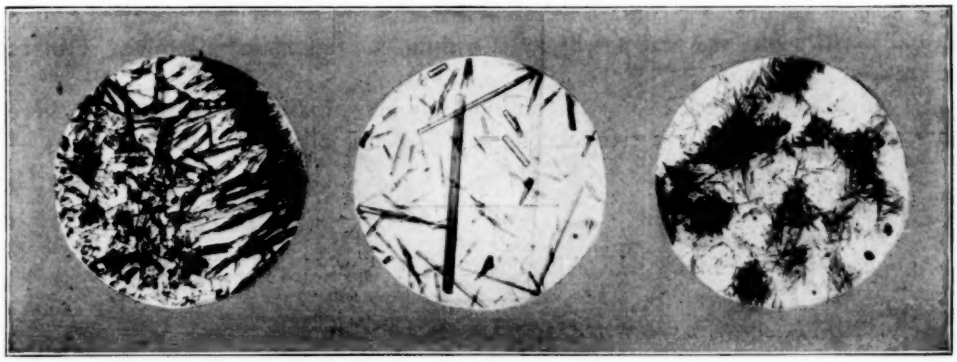
The method of procedure for the isolation of this alkaloid was practically the same in the two cases and, as results were the same, we shall give only the details for the isolation from the powdered drug, which was as follows:—

Five pounds of the finely-powdered drug were first treated with 70% alcohol until exhausted. The tincture thus obtained was evaporated to a viscous liquid. This concentrated liquid was then extracted with five litres of chloroform, divided into five one-litre portions. The chloroformic washings were then mixed and the chloroform distilled off until the liquid was concentrated to 100 cc. This second concentrate was then treated with .5% hydrochloric acid, washing the concentrate in a separatory funnel with five portions of 100 cc. each of the above acid; then six times with 100 cc. each of .25% hydrochloric acid. The combined acid solutions now were shaken out with 900 cc. of benzol in three portions of 300 cc. each. This was to remove the gelsemic acid. Then the residue was shaken out with

chloroform, 400 cc., 300 cc., 300 cc., and 300 cc.—in all, 1300 cc. in order to remove any trace of gelsemic acid.

The chloroformic solution was distilled until a highly concentrated chloroformic solution was left behind. This concentrate was washed with water. This aqueous solution, which was found to be strongly alkaloidal, was evaporated to a solid. This was completely soluble in alcohol. The alcoholic solution was evaporated until highly concentrated and then mixed with sand and dried in current of warm air. The powder which resulted was extracted first with acetone; the residue, left behind from the acetone treatment, was then extracted with alcohol. On evaporation of the alcohol, the hydrochloride of the alkaloid in question crystallized out. Photographs of the crystals of the alkaloid, the nitrate and hydrochloride, are herewith appended.

"SEMPERVIRENE" SALTS AND ALKALOID.



HYDROCHLORIDE. (Crystals on left are the more characteristic.) NITRATE. FREE ALKALOID.

We would suggest as a name for this alkaloid, "Sempervirene." This alkaloid exists in gelsemium only in minute quantities (the exact amount obtained was not determined), and it was only through the insolubility of its salts that it was discovered. On adding hydrochloric acid, sulphuric acid, or nitric acid to a neutral aqueous solution of the hydrochloride, the hydrochloride, sulphate and nitrate, respectively, of the alkaloid are precipitated. Phosphoric acid does not cause a precipitate. The alkaloid is so completely precipitated by the addition of nitric acid to the aqueous solution of the hydrochloride, that only a faint opalescence is produced by the addition of Mayer's reagent to the filtrate. In the insolubility of its nitrate the alkaloid shows a striking similarity to cinchonamine.

The nitrate is slightly soluble in alcohol from which it may readily be crystallized, separating in the form of well-defined yellow needles. The nitrate begins to darken when heated to 210°; at 280° C., it formed a black, partially fused mass.

The free alkaloid was prepared from the re-crystallized nitrate. Its chloroformic solution was yellow. The alkaloid formed pale yellow crystals, the characteristic form from alcoholic solution seeming to be short and rather thick needles.

The hydrochloride formed pale yellow crystals easily soluble in alcohol, which

crystallized on evaporation of the aqueous solution in the form shown in the photograph above.

We are convinced that this principle differs from any one that has heretofore been reported and, since we have obtained the same alkaloid from both the fluid extract and from the drug, we cannot believe that it is due to any foreign admixture in the drug. But, in order to assure ourselves that this is not the case, we are having ground, at the present time, a specially selected gelsemium for the purpose and will go over the same work repeatedly in order to reassure ourselves that no error could have crept in from such a source.

Referring to a letter from J. U. Lloyd, with whom one of us (Sayre) has had some correspondence in connection with this subject, he says: "I take it you have surely taken the pains to see that your new alkaloid is not a chemical product, in which some reaction on another of the alkaloids has produced the new one as a split off?" He further states,—"Please bear in mind the fact that drugs at different seasons of the year contain different constituents or varying amounts of the usual constituents, and that possibly you will find variations in gelsemium, in more directions than one."

It would be of interest to us to continue this investigation to see whether there are gelsemiums of different collections in which this alkaloid is absent.

THE STRUCTURAL VARIATION OF ALLSPICE.

WILLIAM MANSFIELD, M. D.

Allspice, *Pimenta officinalis*, is a New World spice. It was not known in Europe until after the discovery of America. The exact history of its discovery, and its subsequent introduction into commerce, is obscured in the haze of passing years. It is definitely known, though, that in the seventeenth century it was imported into England, where it was known by a variety of names. About the close of the seventeenth century, it was in wide use in England as a condiment, and was sold as Jamaica Pepper or allspice. The latter name is in common use to-day, but we do not hyphenate the word as they did formerly. At the beginning of the eighteenth century, allspice was used in medicine. It was not until 1721, however, that allspice was made official in the British Pharmacopœia; and not until 1816, was it made official in the United States Pharmacopœia. In the 1816, U. S. P., allspice was recognized under the name of Pimento; the common name was given as Jamaica Pepper, and its botanical origin as *Myrtus Pimento*. In the 1820 and 1828, Pharmacopœia the oil was official under the title of *Oleum Pimentæ*. In the 1830, U. S. P., its title was Oil of Pimento, from Pimento. In the 1831, U. S. P., both the fruit and the oil were official. The title of the fruit was *Pimenta—Myrtus pimenta*, the berries. The title of the oil was *Oleum Pimentæ*. In the 1842, U. S. P., the title of the fruit was *Pimenta*, Pimento. The unripe berries of *Myrtus Pimenta*. The title of the oil was *Oleum Pimentæ*, Oil of Pimento, from Pimento. In the 1857, U. S. P., the title of the fruit was *Pimenta*, Pimento,—the unripe berries of *Myrtus Pimenta*. The title of the oil

was *Oleum Pimentæ*, Oil of Pimento, from Pimento. In the 1868, U. S. P., the title of the fruit was *Pimenta*, Pimento,—"the unripe berries of *Eugenia Pimenta* (*De Candolle*)." The title of the oil was *Oleum Pimentæ*, oil of Pimento. It was not until 1873 that the name Allspice was applied to this drug. In the 1873, U. S. P., the title of the fruit was *Pimenta*, Pimento, *Syn.* Allspice,—"the unripe berries of *Eugenia Pimenta* (De Candolle)." The title of the oil was *Oleum Pimentæ*, Oil of Pimento. In the 1880, U. S. P., the title of the fruit was *Pimenta*, Pimento, *Syn.* Allspice. "The nearly ripe fruit of *Eugenia Pimenta* (*De Candolle*), (Nat. Ord., *Myrtaceæ*)." The oil was official as *Oleum Pimentæ*, Oil of Pimenta, Oil of Allspice. "A volatile oil distilled from Pimenta. Prep. *Spiritus Myrciæ*." This oil was described, the specific gravity given, etc. The 1883, U. S. P., was similar to that of the Pharmacopœia of 1880. In the 1890, Pharmacopœia, its title was Pimenta, and its common name Pimenta. Its botanical origin was given as *Pimenta officinalis*, (Lindley), (Nat. Ord. *Myrtaceæ*). The oil was of-

Allspice with Male Flowers

Allspice with Perfect Flowers

ficial as *Oleum Pimentæ*, Oil of Pimenta, and it was directed that the oil yield 65 *per cent.* by volume of Eugenol, and a method was given for its assay.

Its first use as a condiment, is the predominating use of allspice to-day.

Allspice is a native of the West Indies. It is also found growing in Central America, Mexico, Costa Rica, Venezuela, and in Cuba. In the latter place, Dr. Britton, the well-known author of the Flora of Northern United States and Canada, has frequently observed it while exploring the wilds of the island. It is cultivated to a limited extent in most tropical countries. The climate and soil-conditions of Porto Rico are well-suited to the growth, and there is little reason why it should not be grown on a commercial scale on the island.

Most of the allspice in the market is collected on the Island of Jamaica. The allspice tree, which is common to all parts of the island, is usually propagated by birds, which are very fond of the ripe fruit. In their flight about the island, the seeds are dropped on the ground. So many seeds are distributed in this manner, that it is not necessary to cultivate the seed and transplant the young trees. In fact, until recent years, the people believed that only bird-distributed

seed would grow. This belief has been disproved by experiments which have shown that if the pulp is removed from the seeds, they will renew their growth and develop into fruit-bearing trees within a period of five years.

The allspice plantations of Jamaica are made up of wild trees, standing twenty to thirty feet apart. The land between them is kept clean of trees and shrubs.

The allspice tree grows to a height of twenty to thirty feet. The bark of the tree is smooth, shiny, and of a greenish-gray color. The leaves, which are arranged opposite on the stem, vary in length from two to seven inches. They are dark-green, shining above, lighter and pellucid-punctate on the under surface. When held between the eye and the source of light, the leaf appears full of small, rounded, translucent bodies. These are the oil-cavities, in which the oil is stored. When the leaf is crushed, the oil-cavities are broken, and the characteristic odor of the oil of allspice is obtained. The oil does not evaporate readily from the dried leaf. Herbarium specimens, collected years ago, still smell aromatic when crushed. It is indeed, surprising to me that the oil is not extracted from the leaves on a commercial scale.

The flowers are of two kinds, and are borne on different trees. The fleshy, perfect flowers, which are the most abundant, grow in clusters. The calyx-tube is ovoid, and divided above into four small, rounded, spreading, persistent sepals. The four white petals are rounded, and in the mature flower are bent back. After fertilization, the petals fall from the developing fruit. The stamens, which are indefinite in number, stand erect from the throat of the calyx. The pistil has a short, erect style, and a two- or three-celled ovary.

The other type of flowers common to allspice, is the so-called "male flowers," (staminate flowers), which are similar in structure to the above, with the exception that the stamens are more numerous, the pistil is abortive, and the ovules are not fertile. It is claimed by many planters, that larger yields of fruit are produced, if a few of the trees bearing staminate flowers are allowed to grow among the trees bearing perfect flowers. This is quite believable, for the reason that this would bring about cross-fertilization, which many plants secure by reason of their floral structure, or by having fertile flowers of one kind only growing on a plant, just as we have in staminate flowers of allspice.

The fruit, which begins to develop as soon as fertilized, matures in August. When fully developed, the fruit is a fleshy berry, about the size of a pea. The outer part of the fruit, is fleshy and of sweet, aromatic taste. When such a fruit is dried, it retains little of the aromatic properties of the slight, immature fruit. The full-grown, but immature fruits, are gathered for market. The gathering is usually done by children, who snap off the fruiting branches by the aid of a forked stick. Later, the branches with fruits, are collected in piles under the tree, and the fruits separated from the stalks and leaves. The green fruits are then taken to paved courts, where the berries are spread out on the pavements, or on specially-constructed frames. The berries are frequently turned during the day by a workman who uses a wooden rake for the purpose. At night, they are covered, in order to protect them from rain and dew. Under favorable conditions, allspice is dried at the end of seven to ten days. The variation in time required for drying allspice, is due to possible rainy days.

Allspice is sometimes dried by placing the berries on drying-frames over heat. When thoroughly dried, they are placed in bags and sent to market.

Allspice of commerce is a fruit, varying in color from brownish-gray to grayish-brown, to reddish-brown, to reddish-black. All the fruits, with the exception of the reddish-black ones, which are at first sweet, then sweet-aromatic, and finally slightly astringent, are first aromatic and then aromatic-astringent. The surface is granular in appearance and rough to the touch. The outline of the fruit varies from indistinctly four- to indistinctly three-sided. The upper part of the fruit is crowned either with the four-parted calyx or its fragments, or by the remains of the cohering calyx-tube, which appears as a gray ring around the rim of the tube. In the center of the small depression, there is a persistent style of variable length. The base of the fruit is either marked by a slightly depressed scar, or attached (rarely) to a short stalk.

On cross-sections the pericarp is about 1 m.m. in thickness. The septa is thin and membraneous. The fruit is two to three-celled, and from one to three-seeded. In the one-seeded form, fragments of the septa are visible. In each cell there is a solitary seed. In the two-celled fruits, the seed is slightly reniform, two-sided, concave on the inner face, and indistinctly beaked. The seeds of the three-celled fruits, are indistinctly three-sided, and slightly angled. The seeds of the two and three-celled forms vary from astringent to astringent-aromatic. Most of the tannic acid is contained in the seed,—at least judging from the taste, one is led to believe that.

The structural variation of allspice is not of recent origin, for I found a similar variation when I examined a sample of allspice which had been placed in our museum many years ago.

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THE PHARMACOGNOSY OF THE MEDICINAL RHAMNUS BARKS.

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INTRODUCTION.

The European Group of Rhamni:—For centuries the bark of a wild shrub, known in England as Alder Buckthorn or Berry Alder, has been used in Europe as a purgative. This bark is now recognized in most of the leading pharmacopœias of the world, under the name of FRANGULA *or* FRANGULÆ CORTEX. The plant yielding the drug, RHAMNUS FRANGULA, (*Linnæus*), ranges along roadsides and in thickets over all of Europe, except the very northernmost parts and east over northern Asia.

Associated with RHAMNUS FRANGULA is RHAMNUS CATHARTICUS, (*Linnæus*), a thorny shrub, named in England, Buckthorn or Waythorn. This plant is also found in northern Africa, India and eastern United States. The fruit, especially, has been employed for many centuries in Europe as a cathartic. It is now official in a few of the European pharmacopœias. As a medicine the fresh, ripe berries are made into a decoction or the abundant juice is expressed and made into a syrup. The juice of the partially-ripe Buckthorn Berries is yellow and

has been used for staining parchments, etc., while the juice from the ripe berries, is of a greenish-purple color and, when evaporated to dryness with lime or alum, produces the well-known water-color pigment, "sap-green." The bark, also, possesses purgative properties, which, in the fresh bark, are said to be more drastic than Frangula.

Among the other European Rhamni may be mentioned RHAMNUS INFECTORIUS, (*Linnæus*) yielding "French Berries"; RHAMNUS SAXATILIS, (*Linnæus*), RHAMNUS TINCTORIUS, (*Waldstein et Kitaibel*) and other species yielding "Persian Berries"; and RHAMNUS CARNIOLICA, (*Kern*) (possibly identical with RHAMNUS SAXATILIS), the bark of which has been found admixed with Frangula. These plants grow wild in southern and eastern Europe and Asia Minor. From French Berries a valuable yellow dye for textiles is prepared and from Persian Berries is obtained the dye used in staining Morocco leather.

The American Rhamni:—Another group of Rhamni furnishing medicinal barks, is found along the western coast of North America. With the settlement of California by the Spaniards, the new-comers noted that the native Indians used the bark of a certain kind of shrubby-tree, as a cathartic. The Spaniards named this plant and its bark Cascara Sagrada (Sacred Bark). The early American settlers used the name "Chittem Bark" (Chittam, Shittem, Shittim, Sittem), the origin of which is unknown. This drug is now official in nearly all the pharmacopœias of the world. It is obtained from the plant RHAMNUS PURSHIANA, (*DeCandolle*), which ranges over the west slopes of the Cascade Mountains, from central California well up into British Columbia, and forms extensive low forests on the valley and mountain sides.

Associated with RHAMNUS PURSHIANA, though ranging more to the south, is RHAMNUS CALIFORNICA, (*Eschscholtz*), locally known as Wild Coffee, found in central and southern California and northwestern Mexico, a shrub or small tree. Probably the bark of this plant was that originally introduced as cascara bark. It was gathered for years along with the RHAMNUS PURSHIANA bark.

RHAMNUS CROCEUS, (*Nuttall*), a shrub of central and southern California, also furnishes a bark with cathartic properties.

Another American Rhamnus which has furnished a medicinal bark is RHAMNUS CAROLINIANA, (*Walter*), of southeastern United States, commonly known as Southern or Carolina Buckthorn.

Foreign Medicinal Rhamni:—Little mention is made, in medical or pharmaceutical literature, of the medicinal use of Rhamnus barks from other countries. The bark of RHAMNUS WIGHTII, (*Wight and Arnott*), of India, is described by Hooper, (1888), who states that it is commonly sold in the shops of Bombay. The plant is included by Tavera, (1892), in a list of the medicinal plants of the Philippines. It is a tall shrub or small tree ranging over the higher hills and valley slopes in the forests of Western Bombay and Madras; is also found in central Ceylon and in Batangas, Philippines. The bark possesses cathartic, also tonic and astringent properties.

A specimen of the bark of RHAMNUS CHLOROPHORUS, (*Decaisne*), from China, was exhibited, in a collection of rare drugs, at the World's Columbian Exposition in 1893. Whether other lots of this bark have ever been received into the United States is not known. This plant, with another species, RHAMNUS UTILIS,

(*Decaisne*), was described and named by Decaisne, from specimens sent to Europe in 1854. Hemsley, however, claims that RHAMNUS CHLOROPHORUS is identical with RHAMNUS TINCTORIUS and that RHAMNUS UTILIS is the same as RHAMNUS DAVURICUS. Fortune, in an account of his travels in China, states that the bark and twigs of these species, mixed together, furnishes the dye long known in Europe as "Chinese Green." In China, the mixed barks are boiled with water, the liquor sopped up with cotton cloth coated with lime, and the resultant beautiful, green color washed out of the cloth. The plants were introduced into France and cultivated for the dye-stuff, but later the project was abandoned because of the high cost of production. The color is, apparently, very similar to sap-green.

LITERATURE AND HISTORY.

Botany:—The term *"rammos"* used by the early Greek physicians and naturalists, is thought to be derived from the Celtic *"ram,"* signifying a tuft of thorns or branches. The name was applied to certain thorny plants by these writers, but from their meager or inaccurate descriptions it is impossible to establish that the plants mentioned by them were any of the Rhamni as we know them to-day.

Theophrastus mentions two kinds of *rammos,* black and white, both thorny, thus shutting out RHAMNUS FRANGULA, which is not thorny. Dioscorides describes three kinds: one with long, flat, soft leaves; one with white leaves, and a third with round leaves. He states that the leaves should be used in the form of poultice for erysipelas and herpes.

Pliny, the Roman physician, under the name *"rhamnos,"* mentions two kinds, one whiter or lighter in color (*candidior*), and more shrubby (*fruticosior*), the branches terminating in straight thorns and with larger leaves. The other kind is darker, more of a reddish-color with curved spines and bearing a sort of pod. It is very evident that the second plant mentioned, is not a modern *Rhamnus* and while the first one has some characteristics of the RHAMNUS CATHARTICUS, one fails to see why it should be described as white, for the bark is black and even the flowers are greenish. Galen makes no further distinction than this one of color.

The early Anglo-Saxons were acquainted with the purgative properties of, at least, the RHAMNUS CATHARTICUS, for we find the plant mentioned in their medical writings before the Norman Conquest. The juice of Waythorn Berries is described as an aperient by Welsh physicians (Physicians of Myddvai), at the beginning of the thirteenth century.

Crescentius (1305), mentions RHAMNUS CATHARTICUS under the name *Spina Cervinæ* and describes RHAMNUS FRANGULA under the name *Avornus,* mentioning the use of the middle bark as an evacuant.

With the enlightenment appearing in natural science at the beginning of the sixteenth century, many important contributions were made to botanical and medical literature. Ruellius (1537), does not recognize RHAMNUS FRANGULA, but does refer to a thorny species of *Rhamnus,* probably RHAMNUS CATHARTICUS.

It is not until Matthiolus (1548), in his commentary on the materia medica of Dioscorides, that a good description of RHAMNUS FRANGULA, with mention of the purgative property of bark and berries, is found in literature. He first uses

the name "frangula" in connection with the plant; (*frango, frangere* meaning "to break," an allusion to the soft and fragile nature of its wood).

Among those who describe one or both plants or refer to their medicinal properties, after Mattiolus, one may mention Tragus (Hieronymus Bock) (1551), a Bavarian clergyman, who carefully illustrated and described several European Rhamni; Eucharius Rosslin (1569), a German physician, who called RHAMNUS FRANGULA "arbor fœtida," from which originated the present common German name for FRANGULA, "Faulbaum"; the Dutch physicians, L'Obell (1576),—to whom is credited the specific name "catharticus,"—and Dodoens (1583), whose writings have been translated into several languages, including English, and constitute a basis for modern pharmacognosy; Dalechamps (1586), a famous French botanist, who mentions the yellow staining properties of the fresh juice of the fruit and the production of green pigment by treatment of this juice with alum; Tabernæmontanus (1588), one of the creators of Germany botany; Bauhin (1596), a famous Swiss professor of botany who fully describes these plants and gives the name "*Alnus nigra baccifera*" to frangula; Camerarius (1598); Gerarde (1666), the author of an English herbal and history of plants; Ray (1696), an English botanist of note, etc., etc.

By this time the botanical characters of most of the European Rhamni were well established. Linnæus (1753), places them in the *Pentandria Monogynia*. He includes both RHAMNUS FRANGULA and CATHARTICUS as natives of Sweden, in his *Flora Svecica* (1745), and mentions as pharmaceutical products derived from them: *Spinæ Cervinæ Baccæ, Syrupus Domesticus, Frangulæ Cortex.*

Jussieu (1787), introduced the term *Rhamnæ* as a generic name and Willdenow (1806), established these plants in the natural system.

The California group of Rhamni was studied by many botanists during the first part of the nineteenth century. Pursh, in 1814, described the plant RHAMNUS PURSHIANA under the name RHAMNUS ALNIFOLIUS, and it was named as a new species by DeCandolle in 1825. RHAMNUS CALIFORNICA was described and named by Eschscholtz in 1823 from specimens sent to him. This plant is closely allied to RHAMNUS PURSHIANA, if not identical with it, as has been repeatedly pointed out from time to time. (Beckett, Rusby, True and Klugh, Brandegee.) RHAMNUS CROCEUS was described and named by Nuttall, from plants seen near Monterey, California, his manuscripts being published by Torrey and Gray in 1838.

About 1850, Mayer mentions the use of Chittem Bark as a purgative among the Indians and trappers in California. Probably the Yokia and Yuki Indians of Mendocino County, California, may be credited with the introduction of cascara bark to the American settlers. These Indians used the bark in decoction—a handful boiled in about a gallon of water—as a cathartic and a kidney-remedy. The Indian name for the plant in *Hosa-kala.*

In 1877, Bundy, in a short article about *Berberis aquifolium* mentions the cathartic qualities of cascara bark and in the following year published a description of the drug and suggested its more general use as a valuable medicine.

Collection and Commerce:—Within a few years after 1877, Cascara Sagrada established a reputation as a tonic-laxative and peristaltic that placed it in the

foremost rank of purgative medicines, and its collection became an established industry in the regions where cascara trees were abundant.

The bark, stripped from the trees during the season (April to August), when it "peels" easily, is laid, outer-side upwards, over racks placed in the open and when dry, it is broken into smaller pieces, sacked, sold to local dealers and shipped out by the car-load.

The trees soon die after the removal of the bark, and the dried wood, either of the tree cut down or standing, has been an added fire-menace to the forests.

The exact amount of frangula and cascara barks entering commerce yearly, is hard to estimate, though it is stated by Henkel that probably more than two million pounds of dried cascara bark, is consumed annually. The total consumption of frangula bark is far less in amount.

Cultivation:—The Cascara plant has been cultivated in Washington, D. C. (True and Klugh), in Michigan (Farwell), in Kew Gardens and in Ireland, but nowhere, as yet, for the commercial production of bark. While there have been very extensive areas of the wild growth in California, Oregon, Washington and British Columbia (Zeig), the annual destruction of trees has also been very large, so that the district of bark-collection has been gradually driven north, until now apprehension has arisen lest the entire natural growth of Cascara trees be destroyed. (True and Klugh.)

Pharmacopœial History:—The fruit of RHAMNUS CATHARTICUS was recognized in the London Pharmacopœia of 1650 and in later pharmacopœias, until the present day. It was official in the U. S. Pharmacopœia, only in 1820. The fresh fruit is now official in the pharmacopœias of Belgium and Greece and in the French Codex, and the Syrup, made from the juice of the fruit, in the pharmacopœias of Belgium, Germany and Switzerland and in the French Codex.

The bark of RHAMNUS FRANGULA has been recognized in the pharmacopœias of central Europe since the middle of the last century, including the Danish, (1868), Norwegian, (1870), Swedish, (1871), German, (1870), Prussian, (1862), Hanoverian, (1861), and Dutch, (1871). It was recognized in the Austrian Pharmacopœia first in 1889, in the French Codex in 1908, in the U. S. Pharmacopœia in 1880, and in the British Pharmacopœia in 1885, though it was omitted from the last edition. Neither is it mentioned in those of Croatia, Hungary, Italy, Roumania, Servia and Spain, but otherwise it is at present recognized in all the pharmacopœias of Europe and in those of the United States and Japan.

The bark of RHAMNUS PURSHIANA, first made official in the U. S. Pharmacopœia of 1890, is now recognized in the pharmacopœias of the United States and Japan, and in all those of Europe except the Finnish, and that of Portugal, which has not been revised since 1878.

None of the other Rhamnus barks have been made official in any pharmacopœia nor do any of them appear in the commerce of Europe or America except, possibly, as adulterants.

Adulterations:—The fruit of RHAMNUS CATHARTICUS and also the juice from the fruit, have both been repeatedly reported as adulterated. The early Edinburgh Dispensatories mention the adulteration of the fresh fruit with fruits of the Dogberry (*Cornus*) and of the Black Alderberry (*Frangula*). The juice of

the fruit was very frequently diluted with water by those who prepared it. (Quincy's English Dispensatory.)

Van Pelt, (1874), points out that the juice of RHAMNUS FRANGULA berries is substituted in Belgium for that of RHAMNUS CATHARTICUS berries. As the former juice is much inferior as a cathartic, the substitution is very reprehensible.

Umney, (1874), states that the freshly prepared juice of Buckthorn Berries has a specific gravity of 1.070 to 1.080, which, after the juice has stood for a year, is reduced to 1.035. However, four commercial samples of fresh juice gave a specific gravity about 1.005, indicating the addition of water to the extent possibly of 500%.

Adulteration of Frangula has apparently never been extensively practiced. The bark of RHAMNUS CATHARTICUS has been found admixed with Frangula bark, and Moser, also Mitlacher, reported in 1905 the presence of RHAMNUS CARNIOLICA bark in Frangula. The barks of several species of *Alnus*, especially of ALNUS GLUTINOSA (Wuerffel, 1907), have been mentioned as adulterants.

Cascara bark has been reported adulterated with RHAMNUS CALIFORNICA bark, but in view of the facts that the species are nearly if not quite identical; that unquestionably the RHAMNUS CALIFORNICA bark was the one originally employed by the Spaniards and named by them Cascara Sagrada; that the chemical constituents cannot be differentiated and that the gross characters of the barks as also their histological structure are very similar, it seems hardly correct to name the one an adulterant of the other. Moss in 1888, and Squibb in 1899, complain of the poor quality of the Cascara of those dates, but attribute it to bark gathered out of season and improperly cured, on account of the heavy demand and high price created for the drug. Rusby, (1890), mentions the bark of CORNUS NUTTALLII, as an adulterant of Cascara bark. Perrot, (1901), mentions the admixture, in Europe, of RHAMNUS FRANGULA bark with powdered Cascara. Miller, (1912), finds in a large consignment of Cascara a spurious bark rather uniformly mixed and present to a considerable extent. In 1913, a large consignment of bark from Europe labeled "BUCKTHORN," received at Chicago, was found to consist entirely of this same *non-Rhamnus* bark. It resembles cascara quite closely, in size, shape and external markings, but, upon closer examination, was found to be the bark of a *Prunus*. The taste is quite astringent, somewhat bitter and has a decided flavor of hydrocyanic acid and benzaldehyde. The structure is much like that of PRUNUS VIRGINIANA bark and the external markings also closely resemble those of unrossed wild cherry bark.

Histology:—Moeller, (1892), places accurate illustrations of the structure of FRANGULA *and of* RHAMNUS PURSHIANA in his *Pharmakognostischer Atlas*. Cabanes, in 1895, refers to the histology of *Frangula* and, likewise, do Sayre, (1897), Wuerffel, (1907), Mitlacher, (1905), and Moser, (1909.)

The bark of RHAMNUS PURSHIANA was first described histologically, by Prescott in 1879, who mentions the presence of "thick-walled' yellow cells." Later, it was more carefully and fully described by Moeller, (1882), who differentiated it from *Frangula*, pointing out the presence of "stone-cells" in the Cascara, and their absence from the Frangula.

Beckett, (1889), refers to the histology of Cascara, and so do Rusby, (1890), and Sayre, (1897), who attempt to differentiate the Cascara barks from RHAMNUS

PURSHIANA and RHAMNUS CALIFORNICA. They find, however, but slight points of difference, principally some distinctions in the characters of the medullary rays.

Perrot, (1900), and Miller, (1912), refer to the structure of Cascara bark in connection with certain adulterants thereof.

Kraemer, (1912), discusses and illustrates the number of cells in the medullary rays of Cascara bark, and Farwell, (1914), compares the medullary rays of RHAMNUS CALIFORNICA bark with those of RHAMNUS PURSHIANA bark, differentiating between the barks by the differences in the rays.

Chemistry:—The chemistry of the *Rhamnus* barks presents much of interest because from the first analysis of frangula bark by Gerber in 1828, it has been observed that the active principles are resinous in nature, difficult to separate from one another and to determine their true constitution. Even at the present day, these analyses are far from being in a satisfactory condition.

Gerber obtained, among numerous other vegetable constituents, 2.7% of yellow resinous coloring matter and 4.6% of bitter-acrid extractive, which he considered contained the active constituents. He noted that the yellow coloring matter became dark-red with alkalies.

Hubert, (1830), analyzed the juice from the fruit of RHAMNUS CATHARTICUS. He found a bitter substance, apparently the active constituent, and closely resembling the *cathartin* of senna leaves, a green coloring matter, which, in the ripe fruit is purple-red, due to the action of acids in the ripening fruit and a brown material, insoluble in alcohol but easily soluble in water.

Fleury, (1842), obtained from the unripe berries of RHAMNUS CATHARTICUS, *rhamnine* in pale yellow crystals.

Kane, (1843), isolated *chrysorhamnine* from unripe Persian berries and *xanthorhamnine* from the ripe berries. *Chrysorhamnine*, ($C_{23}H_{12}O_{11}$), extracted with ether, formed golden-yellow, silky, stellated needles, sparingly soluble in cold water, soluble in alcohol and ether and in alkalies, (though much altered), and by boiling in water is changed into xanthorhamnine, ($C_{23}H_{12}O_{14}$). This latter substance is extracted from the ripe fruit with boiling water and is olive-green in color.

Winckler, (1849), obtained *rhamnine* from the unripe fruit of RHAMNUS CATHARTICUS and *cathartin* from the ripe fruit. He considered that *rhamnine* by the ripening process is converted into *cathartin* and glucose. (This is the first published evidence of the glucosidic nature of these resinous constituents of the *Rhamni*.)

Binswanger, (1849), found in frangula bark the crystallizable yellow coloring principle which was named (by L. A. Buchner) *rhamnoxanthin*, an ether-soluble amorphous resin, one or more alcohol-soluble resins, a bitter substance of resinous nature in which the purgative properties of the bark seem to lie, sugar, gum, tannin, plant acids, extractive, etc. He compared the bark of RHAMNUS CATHARTICUS with frangula bark, and found that the constituents were similar, but included also a bitter, water-soluble, crystallizable substance to which he attributed the greater hydragogue properties of the RHAMNUS CATHARTICUS bark. This principle was differentiated from the *cathartin* of senna leaves and named *rhamno-cathartin*. He found *rhamno-xanthin* also in the seeds of RHAMNUS CATHARTICUS and RHAMNUS FRANGULA. The juice of the ripe berries contained

a violet coloring-matter turned red with acids and green with alkalies, a bitter extractive, etc. The unripe berries and those also of RHAMNUS INFECTORIUS contained only the *rhamnin* of Fleury.

Buchner, (1853), who worked with Binswanger at Munich in 1849, obtained from the root-bark of RHAMNUS FRANGULA, *rhamnoxanthin* in sublimable, golden-yellow needles, very slightly soluble in water, but easily so in alcohol or ether, (especially hot), readily in solutions of ammonia and the fixed alkalies with a fine, purple-red color and in concentrated sulphuric acid with a red color. By neutralization of the alkaline solution, the *rhamnoxanthin* was thrown out as a yellow powder and by dilution of the concentrated sulphuric acid solution with water it was likewise separated out.

Casselmann (1857), obtained the resinous constituent from Frangula in crystalline form, designated it *frangulin* and decomposed it with the formation of glucose and an acid product he named *frangulinic* or *nitro-frangulic* acid.

Phipson, (1858), found *rhamnoxanthin* in the branches of RHAMNUS FRANGULA and of RHAMNUS CATHARTICUS and corroborated Buchner's description of it.

Gellatly, (1858), obtained from Persian berries, a substance which corresponded with Kane's *xanthorhamnin*, but to which he ascribes the formula $C_{48}H_{28}O_{28}$, and which, hydrolyzed, yields grape sugar and *rhamnetin*, ($C_{22}H_{10}O_{10}$) in yellow needles nearly insoluble in cold water but soluble in alcohol or ether.

Kubly, (1866), separated from frangula bark the glucoside, which he named *avornin*, an amorphous resin and a principle similar to cathartic acid, which he had a short time previously isolated from senna leaves. The *avornin* he split into *avornic acid* and glucose.

Lefort, (1866), named *rhamnine* and *rhamnegine* as the coloring constituents of RHAMNUS CATHARTICUS berries.

Stein, (1868), indicated that the *rhamnine* of Fleury, the *chrysorhamnine* of Kane, the *rhamnetine* of Gallatly and the *rhamnine* of Lefort, to be the same substance in different degrees of purity, while the *xanthorhamnine* of Gellatly and the *rhamnegine* of Lefort were also identical, but the *xanthorhamnine* of Kane and that of Gellatly, were not the same substance. He stated that, undoubtedly, *rhamnetin* was identical with *quercetin*. He named as the coloring principles of Persian berries *rhamnin*, soluble in water and *rhamnetin*, insoluble in water. The *rhamnin* upon hydrolysation with dilute acids, or with the ferment present in the fruit, yielded *rhamnetin* and a sugar.

Schutzenberger, (1868), revised the formula of the *rhamnegine* of Lefort and decomposed it with the formation of *rhamnetin* and a sugar isomeric with mannite.

Faust, (1869), stated that the *frangulin* of Casselmann, and the *avornin* of Kubly, are identical, and assigned them the formula $C_{20}H_{20}O_{10}$. He named the acid-resin from the decomposition of this glucoside, *frangulic acid*.

Liebermann and Waldstein, (1876), identified *emodin* (trioxymethylanthroquinone) from frangula bark and stated that frangulic acid is probably *emodin*.

Liebermann and Hormann, (1878), found *rhamnoxanthin* in the pericarp of the berries of RHAMNUS INFECTORIUS and determined that, under the action of a ferment, it splits into *rhamnetin* and *isodulcite*.

Prescott, (1879), was the first to analyze cascara sagrada bark. He found

a brown resin of strongly-bitter taste, colored a vivid purple-red by potassium hydrate solution, sparingly soluble in water or ether, but freely so in alcohol, chloroform, benzole, carbon disulphide and solutions of caustic alkalies, though precipitated from the latter by acids. He found also some other resins, tannin, oxalic and malic acids, etc.

Limousin, (1885), noted that the scraped surface of Cascara bark, touched with strong ammonia or potash solution, gave a fine red coloration and considered it an incontestable evidence of *chrysophanic acid*, which he declared the "resins" of Prescott to be.

Ward and Dunlop, (1887), described the enzymatic action in the berries of RHAMNUS INFECTORIUS, but found that no such action took place in the fruits of RHAMNUS TINCTORIUS, CATHARTICUS, CAROLINIANA, etc.

Meier and Webber, (1888), mentioned in addition to other constituents found in RHAMNUS PURSHIANA bark, an enzyme, to which they attribute the griping effects and the epigastric pain sometimes accompanying the use of the drug, especially of the fresh bark.

Eccles, (1888), found minute quantities of an alkaloid present in Cascara fluid extracts.He also examined twenty prominent drugs by treating the ethereal extracts obtained from fluid extract, with ammonia water and found that the ethereal extracts from frangula and cascara barks alone assumed a red color. He did not distinguish between them.

Schwabe, (1888), found frangula to yield *frangulin* 0.04%, and *emodin* 0.1%. He corroborated the physical characters of *frangulin* as stated by Casselmann and Faust and amplified upon them. His proximate analysis indicated the formula $C_{21}H_{20}O_9$. *Frangulin*, by hydrolysis, yields *emodin*. He found in cascara bark *emodin* but no *frangulin*.

Hooper, (1888), examined the bark of RHAMNUS WIGHTII. He reported several resins, some ether-soluble, some alcohol-soluble, tannin, bitter principle, etc. From the published analyses of RHAMNUS PURSHIANA bark, he concluded that the two barks rather closely correspond chemically, though the former probably had a larger tannin-content. He mentions a yellow coloring-matter in the phloem layer of the bark, which assumes a brilliant red with potash.

Thorpe and Miller, (1892), corroborated Schwabe's formula for *frangulin* and determined that the sugar from the decomposition of *frangulin* was a true *rhamnose*.

Leprince, (1892), isolated a crystalline constituent from cascara bark which formed prismatic needles of a yellow color, insoluble in water, slightly soluble in chloroform but readily so in alcohol and in aqueous solutions of alkalies with a purple-red color. He named it *cascarine*.

Phipson, (1892), regarded the principle isolated by Leprince as identical with *rhamnoxanthin* described in 1858.

Perkin and Geldard, (1894), named the coloring principles of the fruit of RHAMNUS INFECTORIUS: *rhamnazin*, *rhamnetin* and *quercetin*.

Cabanes, (1895), reported that, in sections of frangula bark, treated with alcoholic potassa solution, the parenchyma of the cortex, medullary rays and bast, all acquire a strong red color, but that in cascara bark sections, only one or

two layers of the cortical parenchyma, the medullary rays and the five or six inner rows of bast parenchyma, take the color. Ammonia and soda solutions react the same as potassa.

Dohme and Englehardt, (1897), obtained what they declared to be the glucoside of cascara bark, *purshianin,* in dark, red-brown needles, not responding to the tests for *emodin,* nor identical with *frangulin,* but yielding, by hydrolysis, *emodin* and a sugar.

Sayre, (1897), proposed identity-tests for distinguishing between the barks of RHAMNUS CALIFORNICA and RHAMNUS PURSHIANA as follows: To 0.2 gm. of the powdered bark in a small test-tube add 2 cc. of potash, T. S. RHAMNUS CALIFORNICA gives a blood-red color at once. RHAMNUS PURSHIANA an orange-red color.

Leprince, (1899), reports cascara bark to contain *chrysarobin, emodin* and *chrysophanic acid.*

Aweng, (1899), presented a method for separating the glucosides of frangula, cascara and rhubarb into groups, by successive extraction with benzene, benzene and absolute alcohol, and 60% alcohol. He obtained a number of glucosides, in varying proportions, from each of the three drugs, most of them yielding, by hydrolysis, *emodin, chrysophanic acid* and *frangula-rhamnetin.*

Oesterle, (1899), found that *frangula-emodin* differs from *aloe-emodin.*

Perrot, (1900), stated that powdered frangula bark with alkalies, produces a deep-red color, but that powdered cascara bark gives a yellow-color and that the powders could be distinguished in this manner.

Tschirch and Polacco, (1900), analyzed RHAMNUS CATHARTICUS fruit and determined the presence of *emodin,* several coloring matters, a sugar, etc. The purgative action was ascribed to the *emodin.*

Jowett, (1904), found in cascara bark, *emodin,* glucose, an enzyme, fat, etc. His attempts to isolate the bitter principle, were unsuccessful, but he claimed that *emodin* was not the most important purgative principle. The enzyme, in one-gram doses, was not griping. There was practically no distinction in the chemistry of the barks from RHAMNUS PURSHIANA and RHAMNUS CALIFORNICA.

Warin, (1905), presented a colorimetric method for the quantitative determination of the *emodin* in frangula bark, by neutralizing the rose-red tint of a measured, alkaline, aqueous extract of the drug, with the green tint of a standardized, nickel-salt solution. Later, he pointed out that, before this method could be applied to cascara bark or its preparations, the same must be so treated as to hydrolyse the glucosides.

Tschirch and Pool, (1908), found that the *emodins* from frangula and cascara barks were identical, that neither of the barks yielded *rhein,* but that *chrysophanic acid* was present in frangula bark. They approved Warin's colorimetric assay.

Waljaschko and Krassowski, (1908), claim that the same coloring principles occur in the fruits of RHAMNUS CATHARTICUS as in those of RHAMNUS INFECTORIUS and RHAMNUS TINCTORIUS. In addition the fruits of RHAMNUS CATHARTICUS were found to contain about 2% of *emodin* bodies.

Tschirch and Bromberger, (1911), obtain from the bark of RHAMNUS CATHARTICUS, *frangula-emodin,* chrysophanic acid, *rhamnofluorin, rhamnosterol,* glucose, tannin, etc.

Oesterle, (1911), states, regarding the oxymethylanthroquinones, that *aloe emodin* reduced, forms chrysophanic acid, but oxidized, forms *rhein,* while chrysophanic acid oxidized, likewise forms *rhein.*

Tutin and Clewer, (1911), state that the anthroquinone derivatives from rhubarb,—*rhein, emodin, aloe-emodin, frangula-emodin, emodin-monomethyl-ether* and chrysophanic acid, are derived from medicinally inert glucosides; that only *aloe-emodin* and chrysophanic acid possess purgative properties, and that most of the purgative value of the drug, lies in a non-glucosidic resin which they isolated.

Rosenthaler, (1911), presents a list of anthroquinone drugs distinguished from one another by the physical characters of their micro-sublimates and the color-reaction of these sublimates in alcoholic solution with ferric chloride solution.

Schmidt, (1912), describes *frangulin, (rhamnoxanthin),* ($C_{21}H_{20}O_9$), as occurring in lemon-yellow, glistening, fine needle-crystals, odorless and tasteless, melting at 228° to 230° C. It is almost insoluble in water and in cold ether, but soluble in 180 parts of 80% hot alcohol. Concentrated sulphuric acid dissolves it with a dark-red color and with caustic alkalies it forms solutions of a purple-red color. By boiling with an alcoholic solution of hydrochloric acid, it becomes converted into *rhamnose* and *frangula-emodin,* ($C_{15}H_{10}O_5$), which forms bright-red, glistening needles melting at 255° C. It is insoluble in water, slightly soluble in alcohol and easily in chloroform and benzol In ammonia it dissolves with a red, slightly bluish color.

(To be continued.)

A NEW METHOD FOR THE ESTIMATION OF GLYCERIN IN PHARMACEUTICAL PREPARATIONS.

C. H. BRIGGS, M. S.

Glycerin is one of the most common and generally used substances in pharmacy and yet its quantitative determination in pharmaceutical preparations presents many difficulties. On several occasions in our laboratory it has been necessary to attempt to assay for glycerin such preparations as elixirs, tooth-pastes, shaving soaps, liquid face creams, and essences of pepsin, and the results have been far from satisfactory. Several methods with necessary modifications to adapt them to the particular preparations were tried, but in some cases the duplicate results showed marked variations, thus making doubtful the reliability of the process.

The official methods for the determination of glycerin in wines are not applicable to all pharmaceutical preparations because of interfering substances and, to say the least, they are long and tedious. (See Allen's Organic Analysis, Vol. 1, page 167.)

It would seem therefore that a simple and reliable method for the estimation

of glycerin, applicable to all pharmaceutical preparations, is much to be desired. For pharmaceutical purposes it is not necessary that the method shall be extremely accurate, for if the results do not vary more than 2% from the actual glycerin content, this will meet all practical requirements.

Pharmaceutical preparations contain such a wide range of substances such as sugars, salts, organic acids, soaps, proteids, resins, colors, etc., that it is almost impossible to separate the glycerin in a pure condition by means of solvents and precipitants. It occurred to the writer that perhaps the glycerin could be separated from many of these substances by distillation in a vacuum, provided some liquid could be added with which the glycerin is not miscible and which would also distil and help carry over all of the glycerin. Glycerin boils at 162° C. at 10 m. m. pressure, but by the law of partial pressures, it will vaporize at a lower temperature if distilled with some substance with which it is not miscible. After the trial of several substances it was found that santal oil was best adapted for this purpose, and that, if a small amount of glycerin was distilled with a relatively large amount of santal oil, the glycerin was completely carried over. It was also found that the glycerin could be readily separated from the santal oil in the distillate by dissolving the oil in purified petroleum benzine and washing out the glycerin with small quantities of water in a separatory funnel. The glycerin in the combined aqueous solutions could then be estimated by various methods, but the writer prefers evaporating off most of the water at a low temperature and completely de-hydrating the glycerin in a vacuum over sulphuric acid. This procedure has not been noted elsewhere in the literature.

The glycerin used in these tests was of the ordinary U. S. P. grade and when about two grams were dried in a vacuum over sulphuric acid for 24 hours, it lost about 3% of moisture. Water was then added and the solution evaporated to a thin syrup at about 50° C. After drying for 24 hours in a vacuum as above the same weight of anhydrous glycerin was recovered, showing that none had been lost by the de-hydration.

Two determinations by the above distillation method of a 20% solution of glycerin in water gave 99.3% and 100.8% of the glycerin, showing that where there are no interfering substances the method works satisfactorily.

The method was next tried on a mixture containing 10% of sugar and 10% of glycerin. Three determinations gave 110, 109 and 108% of the glycerin taken. A test with Fehling's solution showed that some of the sugar was decomposed and carried over with the distillate. The addition of a small quantity of slaked lime to the distillation flask prevented the sugar from going over but it also held back part of the glycerin. Calcium carbonate did not prevent the sugar from being carried over but calcined magnesium oxide worked better and three determinations of the glycerin in a solution containing 20% of sugar and 20% of glycerin, using one-half gram calcined magnesia, gave 100.1%, 101.5% and 99.9% of the glycerin content. The use of more magnesia did not work as well.

In order to test the method on products containing various ingredients, samples

were prepared of six preparations of widely different character. The amount of glycerin found was as follows:—

	Glycerin used	Glycerin found
Elixir Gentian Glycerinated N. F.	50%	49.4% 48.9%
Tooth Paste	50%	48.1% 48.6%
Shaving Soap	25%	27.6% 26.7%
Essence of Pepsin	20%	18.8% 19.7%
Elixir Lactated Pepsin	10%	10.5% 11.4%
Stearic Acid Cold Cream	8%	7.2% 8.1%

While these results are not as accurate as the writer at first hoped for, still considering the wide range of the preparations, the results are fairly satisfactory as they give a good indication of the amount of glycerin present and probably accurate enough for all pharmaceutical purposes.

The method is not applicable without some modification to preparations where there is a large amount of sugar and a small amount of glycerin, as some of the sugar decomposes and is carried over. One test was made on such a preparation by repeating the distillation and the result was slightly low.

The length of time required to complete a test by this method is about two days, but four or five tests can be made per day, so that the actual time consumed is about two hours per assay.

The apparatus found most convenient for this assay consisted of a 500 cc. distillation flask with the side neck bent so that the flask would be inclined to an angle of 45° when in use. The top of the flask was cut off to within 1½ inches of the side neck, and the flask was closed with a rubber stopper fitted with a glass tube drawn to a very fine capillary. The flask was connected to an ordinary straight tube condenser, the side neck being inserted well into the condenser. For a receiver an 8 oz. Squibb separatory funnel was used and the end of the condenser was bent slightly and inserted into the large end of the separatory funnel so that the funnel rested horizontally. This enabled the vacuum to be connected to the small end of the separatory funnel and at the same time allowed the funnel to act as a receiver for the distillate.

The method in detail is as follows:—

Take sufficient of the sample to obtain about two grams of glycerin and place in the 500 cc. side neck distillation flask with one-half gram of calcined magnesium oxide. Warm on a steam bath for five minutes. Now add 75 cc. of santal oil and distil in vacuo until about two-thirds of the oil has been distilled. Rinse the

condenser with about 100 cc. of purified petroleum benzine and add to the distillate. Now rinse the condenser well with 5 cc. of water and add to the distillate. Stopper the separatory funnel, shake well, and draw off the aqueous layer into a second separatory funnel. Extract the benzine oil solution three times with 5 cc. of water to completely remove the glycerin and add to the first extract. Shake the combined aqueous extracts with 30 cc. of petroleum benzine to remove traces of oil. Allow to stand one-half hour and draw off the aqueous layer into a tared four inch petrie dish. Rinse the separator with 5 cc. of water and add to the glycerin extract. Evaporate off most of the water at a low temperature (not over 50° C.) and de-hydrate in a vacuum dessicator over sulphuric acid for 24 hours or to constant weight. This anhydrous glycerin is very hydroscopic and must be weighed quickly. To convert to ordinary commercial glycerin divide the weight obtained by .97.

The distillation must be carried out cautiously at first to prevent bumping. After the water has passed over, the distillation proceeds quietly and can be carried out rapidly. A free flame should be used and this should be held in the hand and kept in constant rotation around the bottom of the flask.

In conclusion the writer wishes to express his thanks and indebtedness to Mr. W. B. Parker, who carried out the assays and did most of the experimental work in connection with this paper.

Scientific Department Parke, Davis & Co., August 26, 1914.

A SIMPLIFIED GLYCERIN ASSAY.

F. T. BRADT.

The object of this investigation has been to work out a simple, rapid, and accurate method of estimating the quantity of glycerin in a sample reasonably free from impurities.

The wide variation in results of assays in recent years was deemed of sufficient importance to warrant the appointment of committees in this country and Europe to study methods of analysis and recommend the ones that gave most satisfaction. As a result it was agreed that the acetin method should be the basis on which glycerin should be bought and sold, but that the dichromate method might continue to be used for technical purposes in a properly standardized form. The exact procedure to be followed in purification was described very minutely and also the actual process of assay. The dichromate method was substantially the same as that proposed by Hehner, using solid dichromate for oxidation, an excess of ferrous ammonium sulphate, and dilute dichromate solution to titrate the excess.

Many other methods, besides these two well-known ones, have been suggested for the assay of glycerin, and some of them are well worth a brief review.

In 1891 [1]Benedikt and Zsigmondy proposed to oxidize glycerin with potassium permanganate in alkaline sol. precipitate the manganese by treatment with H_2O_2,

[1] Zeit. Angew. Chem., 1891, 400–401.

add sulphuric acid, and titrate the oxalic acid formed with volumetric permanganate. The advantage claimed for this method is that butyric acid, if present, does not interfere; chemically it is little different from the dichromate method, but is lacking in the simplicity of the latter.

Five years later [2]Bordas suggested adding potassium dichromate (48 gm. per litre) to 5 cc. of a dilute glycerin solution until the color changed from a bluish green to a yellowish green. If the glycerin be either too dilute or too strong, difficulty will be experienced in detecting promptly the color change. Two years later Maurice Nicloux pointed out that the above method was based on the supposition that glycerin is oxidized to formic acid. He pointed out the fact that it was changed directly to CO_2 and water, giving as the equivalent 37.28 gms. per litre, and not 48 gms. as first proposed.

A method proposed by [3]Simon Zeisel in 1902 is especially interesting. He proposed to distill the glycerin with 63 *per cent.* hydriodic acid in a current of carbon dioxide. The vapors, cooled to 60°, are passed through a small wash bottle containing amorphous phosphorus suspended in water to remove iodine or hydriodic acid fumes. The isopropyl iodide formed is then passed through a four *per cent.* alcoholic silver nitrate solution and the silver iodide collected and weighed. Schultze, in 1905, in a paper giving a comparison of results by various methods, insists that this is the only trustworthy estimation in many cases.

[4]Chaumeil, in 1902, suggested oxidizing glycerin with iodic acid in the presence of sulphuric acid and titrating the iodine liberated with thiosulphate. Chlorides, of course, will interfere, but by a preliminary estimation a correction may be made.

The specific gravity method is recommended by [5]Stiepel, subtracting from the percentage found, the *per cent.* of ash multiplied by 3.33. This, of course, would only hold good in the presence of small amounts of salts. However, the method may be of marked value as a means of quick checking.

An extraction method is described by [6]Schukoff in which he uses a sample containing about one gram of glycerin and evaporates to a syrupy consistency on a water bath. It is then mixed with twenty grams of anhydrous sodium sulphate, and extracted with anhydrous acetone in a Soxhlet apparatus. After evaporating the acetone the residue is weighed as glycerin.

A method which at first seems very simple and satisfactory is one proposed by [7]Wagenaar in 1911. He precipitates copper by means of a fixed alkali in the presence of glycerin. The glycerin holds a quantity of copper in solution varying with certain physical constants. This is determined by causing liberation of an equivalent of iodine which is titrated with thiosulphate. In calculation of results an empirical table is used giving the quantity of glycerin equivalent to from one to thirty cc. of thiosulphate.

Three other methods may be just mentioned, (a) the litharge method which

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2 Compt. Rend., 1896, 1071–1072.
3 Chem. Centr., 1902, 1424–1425.
4 Bull. Soc. Chem., 1902, 629–634.
5 Chem. Centr., 1904, 1626–1627.
6 Zeit. Angew. Chem., 1905, 294–295.
7 Pharm. Weekblad, 1911, 497–502.

gives results neither theoretically correct nor in themselves concordant. (b) The oxidation with sulphuric acid and weighing of the glycerol carbon, and (c) treatment with excess of KOH and lime at 320° and collection of the hydrogen.

Recently a modification of [8]Hehner's method has been proposed and highly recommended as being very practical for the ordinary laboratory routine. It is carried out something as follows:

Weigh accurately 5 gm. of glycerin and dilute with distilled water to 500 cc. Transfer 25 cc. of this solution into a 200 cc. beaker; add 40 cc. of a solution of dichromate (made by dissolving 74.615 gm. of potassium dichromate in 750 cc. of water, adding 150 cc. of sulphuric acid, and sufficient water to measure one litre at 25° C.), and 25 cc. of sulphuric acid. Cover the beaker and heat on the steam-bath two hours. Dilute the solution to 500 cc. and mix well. Remove 50 cc. to a 500 cc. flask, add 3 grams of potassium iodide and allow to stand five minutes. Dilute with 150 cc. of water and titrate the liberated iodine with N/10 sodium thiosulphate.

Each cubic centimetre of N/10 thiosulphate used indicates an excess of 0.0657 cc. of dichromate solution and each cubic centimetre of the dichromate solution is equivalent to 0.01 gm. of glycerin.

Several disadvantages have been found in working with this method. It seems to present many unnecessary complications. The number of dilutions necessary in carrying out the operation would seem to offer fertile ground for error. The use of such a concentrated solution of dichromate makes the temperature-factor very important, Hehner having shown that a variation of one degree causes an expansion of .05 *per cent.* Failure to recognize this fact might in itself introduce a very considerable error. Further, the solution used is stronger even than theory requires. Assuming that two and one-third molecules of dichromate are required to oxidize one of glycerin, then 74.5675 grams is the equivalent of 100 grams of glycerin and not 74.615 as proposed. Again, the time required for oxidation is longer than actual experiment shows to be necessary. In working with glycerin, slow oxidation would seem to indicate oxidation of impurities, which must be avoided as far as possible. Twenty minutes was found to be ample time to completely oxidize a sample of glycerin by this method. A further complication is introduced by the use of 50 cc. for the final titration when it is just as easy and satisfactory to use 32.88 cc. and avoid the use of a factor in the final calculation.

With these facts before us, then, we suggest a simple modification of the proposed dichromate method. The process is as follows:

Weigh out accurately 5 grams of glycerin, dilute to 100 cc. and take exactly five cc. (equivalent to 25 milligrams of the glycerin) for titration. Add 50 cc. of N/10 potassium dichromate solution, 25 cc. of sulphuric acid, and heat on a steam-bath for 20 minutes. Cool, add one gram of potassium iodide, and after standing 10 minutes, dilute with 150 cc. of water. Titrate the liberated iodine with N/10 sodium thiosulphate and calculate the percentage of glycerin.

Comparative results show this method to be very satisfactory. It is simple, rapid, and reasonably accurate. The dichromate solution is one that every laboratory uses constantly and so the making of new solutions is avoided. Although

[8] Analyst, 1901.

the solution is much more dilute than the one proposed, still twenty minutes is ample time to completely oxidize the glycerin.

We tried checking our results by means of the specific gravity method and found that it may be feasible with certain cautions. First, there seems to be a surprising lack of complete glycerin specific gravity tables, and in those we have, there is a question concerning the accuracy of the expansion factor for dilute solution. On the other hand, if concentrated glycerin solutions are used, temperature becomes very important, an error of 0.1° in reading causing an error of nearly 0.15 *per cent.* in the amount of glycerin. But using a solution of from 60 to 80 *per cent.* glycerin and being very careful in reading the temperature a reasonably accurate check may be obtained for the oxidation method.

The following results give a fair comparison of the two methods, showing how they may be used as comparative methods.

SPECIFIC GRAVITY METHOD.

WATER	COMMERCIAL GLYCERIN	TEMPERATURE	CORRECTED SP. GR.	PERCENT OF GLYCERIN
14.8920 gms.	23.7315 gms.	80° F.	1.1526	95.08
20.1857 gms.	19.2522 gms.	82° F.	1.1194	95.14
20.0300 gms.	10.2064 gms.	82.7° F.	1.0809	95.02
.....	31.113 gms.	85.1° F.	1.2537	95.20
			Average.....	95.11

DICHROMATE METHOD.

N/10 THIO. CORRECTED	N/10 DICHROMATE	PERCENT OF GLYCERIN
19.58 cc.	49.40 cc.	95.36
19.56 cc.	49.40 cc.	95.39
19.60+ cc.	49.40 cc.	95.23
19.53 cc.	49.40 cc.	95.49
	Average	95.37%

DISCUSSION.

MR. VORISK:—I would like to ask the second speaker about the titration of that liquid after the oxidation has taken place,—What indicator is used?

MR. BRADT:—Simply use potassium iodide and the iodine liberated is titrated with thiosulphate, using starch as indicator. The color changes from blue to green.

THE NECESSITY OF A METHOD OF ESTIMATING THE INTRINSIC VALUE OR ESSENTIAL QUALITIES OF COFFEE.

L. E. SAYRE.

It has always seemed to the writer that the references in formularies, such as our National Formulary, in specifying the commercial or geographical brand of coffee, are made with a definiteness which is rather superfluous. To say, for example, that a coffee must come from Java and Mocha is a rather excessive discrimination. This will appear when it is shown that there are other brands than Java and Mocha (usually specified) which will give to coffee preparations equally fine flavor peculiar to the roasted berry. It is true that Mocha and Java coffees have a fine flavor widely esteemed, but Santos coffees for example, are immensely popular among American consumers and are

said to be fast supplanting the milder growths of other countries, the finer grades being invariably smooth and pleasing in liquor and flavor, possessing all the essentials of fine coffee. In point of quantity, it is stated by coffee dealers that Brazil heads the list of coffee producing countries, its annual product ranging from 7,000,000 bags to 8,000,000 bags of 130 pounds each, *75 per cent.* of which is exported to the United States.

To give some idea of the brands or grades of coffee which are distributed in the Middle West, we give the following tabulated statement of one of the largest coffee distributors in that section.

PRINCIPAL BRANDS AND VARIETIES OF COFFEES SOLD IN WESTERN MARKET.

Commercial Classification.	*Variety or Grades.*
Mandheling	33
Java	24
Mocha	Many
Buckaramanga	20
Bogota	20
Maracaibo	20
Guatemala	20
African Java	10
Peaberry from Mexican Rio and Santos	Number almost indefinite
Santos, Bourbon	Number almost indefinite
Rio	Many grades
Victoria	5

Botanically speaking, the genus known as Coffea is divided by botanists into some sixty species, of which fifteen are referred to Africa, seven to Asia and about twenty-two to America; but there is abundant reason for supposing that the majority of these so-called species are but mere varieties, a single genus, due to different conditions of soil, climate and cultivation.

According to some botanists, there is but one genus and species of the coffee plant, Coffea Arabica. Others again contend that there are two separate and distinct species, classed as Coffea Orientalis and Coffea Occidentalis. While admitting but one genus, the difference in size, appearance and product being attributed by them to a variation in the soil, climate, and method of cultivation. There are three principal varieties, however, readily distinguished and recognized by those who have much to do with it and are known to commerce as Coffea Arabica, Coffea Liberica and Coffea Maragogipe, lately discovered in Brazil, all of which, or their transplants, furnish the coffee of the market.*

It happens to fall to the lot of the Drug Laboratory of the University of Kansas, to examine, for the state, samples of coffees sent in by inspectors. No attempt is made to report on the quality, such as flavor, or commercial value, because of the entire absence of reliable tests, such as would stand in the courts, but enough experience has been gained to make the statement that there are a great number of brands and blends which furnish as fine a flavored preparation as that of Java and Mocha. For example, we have received during the past year an invoice from the Jamaica coffees which are grown in the upland and those which are grown in the lowland. Those from the upland, when properly roasted

* Coffee, Its History, Classification and Description: Walsh, page 37.

are of as elegant a flavor as that from Java or Mocha. The same may be said of the best brands of Santos coffee. Theoretically, therefore, it is unnecessary to confine, for pharmaceutical purposes, coffees to those of the definite geographical origin usually stated.

The quality of coffee, i. e., the "æsthetic" quality, which we find in the flavor or aroma, is not due to the caffeine or the caffeo-tannic acid content, and, indeed, to no one of the principles which are usually included in the so-called official analyses.

Most any one who is familiar with the different brands of coffee acknowledge that Mocha and Java have very agreeable and "fine" flavors as above stated, but an analyst would be brave who would go before the courts and attempt to prove that they were worthy of this distinction, from the results of the "cup test," for example. That is to say, there is no scientific data which may be regarded worthy of the attribute "accuracy" which can be offered as evidence or proof of relative qualities,—"good," "better," "best," or "poor," "fair" or "fine."

Those who have followed the literature upon this subject no doubt are familiar with the fact that the so-called aromatic or æsthetic properties were contained in the volatile principles which may be recovered by sublimation or distillation.

One report upon this, made some years ago (Merck's Report, 1907, page 61), stated as follows regarding a sublimation test: Operating upon 500 grams, it was stated that "only a few drops of a colorless liquid were obtained in a second receiver. This product suggested an odor akin to capronic acid, mixed with a trace of valeric acid. It was acid in reaction, very powerful and penetrating, diffusing very rapidly in the air, and when thus very highly diluted, gave the pronounced odor of coffee. The condensed liquid, in the first receiver was of a yellowish brown color and had a rather acrid and ammoniacal odor; it also, when diffused, suggested the odor of coffee." It was then stated that the characteristic aroma developed in the roasting of coffee is due possibly to a mixture of organic acids and compounds of phenolic origin. Erdmann, in the *Berichte der Deutschen Chemischen Gesellschaft,* 1904, refers to the oil of coffee which has been obtained by treating roasted coffee with steam. The yield from 150 kilos of roasted and ground Santos coffee was 83.5 grams or 0.0557 *per cent.* of an oil of brown color, of a specific gravity of 1.0844, and strong odor of coffee. On distillation of the oil, the greater portion passed over between 150° and 190° C. in the form of a light colored oil. This contained furfur alcohol and much valeric acid.

In connection with the process of roasting, it is worthy of note,—First, the effect of roasting of coffee produces, by partial carbonization and partial caramelization, a number of insoluble constituents and an equal number, perhaps, of soluble ones, which have a definite relation to the flavor of the coffee. But the quantitative relationship of the æsthetic qualities seems impossible to make, partly because of the very minute quantity of the aroma-containing constituent; the so-called caffeol, which is produced by roasting, does not often exceed .06% and thus far we have no easy means for estimating this quantitatively. From an ordinary infusion or decoction, this aromatic principle can be washed out by means of chloroform. On the evaporation of the chloroform, the caffeine crystallizes out and the chloroformic residue, when washed with ether, yields a substance which

has the aroma of coffee and also the bitter flavor, and this peculiar flavor differs according to the brands, or blends, of coffee. Yet, this process, usually followed with a chemical process designed to give quantitative results, can be regarded as of qualitative value only. It would be interesting to have the chemical nature of these bodies definitely stated but statements thus far made give only a suggestion of their possible composition.

Recently, valuable papers have been published, which bear upon this subject, of the volatile products of coffee. One of special interest was published in the *Bulletin General de Therapeutique*, Sept 15, 1913, by M. I. Burmann, who states, in substance, that the volatile "toxic" principle in coffee is not caffeine but lies in the associated principles of that alkaloid; that "decaffeinated coffee is as noxious as the caffeinated," and that an "atoxic coffee" is one that has these toxic principles removed. These, he finds to be the volatile principles and separable by distillation.

An aqueous distillate is collected in refrigerated ether. The ether separated from the aqueous distillate and the etherical layer dried by means of calcium chloride. The ethereal solution is then distilled under diminished pressure and the noxious principle, in very small percentage, is left behind in the residue. This principle, which the author terms, "caffeo-toxine" is a colorless, refractive liquid which soon decomposes into a yellow and finally to a black color. This principle, the author refers to as of phenolic, aldehydic or ketonic character.

In an abstract of an article by G. Bertrand and G. Weisweiler, published in the Analyst, Sept., 1913, p. 417, the volatile principle of coffee is referred to as a "pyridine-like body." This statement seems to agree with the results which we have obtained in our laboratory.

Burmann, in extracting the volatile principle, made use of 10 kilograms of the finely ground roasted coffee, which was distilled with steam until about 30 liters of distillate were obtained. This was extracted with 10 liters of pure ether, etc. It is unnecessary to point out that such a process would be impracticable for any routine analytical procedure. But the necessity for estimating chemically the essential qualities of coffee becomes urgent and apparent when we remember the present loose and inadequate commercial classifications based on purely geographical data.

Doctor C. F. Nelson and myself have endeavored to find reagents that will determine quantitatively the constituents above named, i. e., the tannin-like bodies, which belong to the polyphenols, and the pyridine-like bodies, and to make these determinations by "micro-chemical" methods.

We are encouraged to believe that we may be able soon to furnish data concerning these two constituents by means of both colorimetric and "nephelometric" methods. We are at present working with the color reaction, produced by phosphotungstic acid, which we have found, thus far, to be extremely delicate. By this method a quantitative accuracy of five parts per million seems to be attainable.

To say the least, this topic opens up an interesting question. The recent investigations point also to a corelative one which has a bearing on the dietetic problem in connection with the beverage.

If it can be proven that this volatile principle is toxic, it is detrimental to public

welfare to place a high value, commercially, on that which is injurious physiologically. If we estimate a coffee in proportion to the amount of the toxic ingredient, this is not in harmony with the principles regulating the value of dietetics.

Finally, if the pyridine-like body is developed by the roasting process, does not the same principle develop in the roasting of cereals and in chicory? Our experiments seem to indicate that this may be true.

DISCUSSION.

MR. WM. C. KIRCHGESSNER:—I would like to ask, if I may, if you cannot estimate the value of the coffee by the caffein content?

PROF. SAYRE:—You cannot estimate the value of coffee by the caffein content. You can sometimes obtain a very high caffein content from cheap coffee, and from a very expensive coffee you may get a very low yield in caffein content.

MR. KIRCHGESSNER:—Why is it that all the Decaffa Coffees are so dark? I have had men who make it a business of roasting coffee tell me that they could produce Decaffa Coffee at the same price that any other coffee could be sold. They would put the coffee in a roaster, tighten the cap and apply heat and after the coffee was roasted for a certain length of time let the roaster cool, cap up. After taking off cap a dark brown powder would adhere to the top of the roaster which they claimed was the caffein. I got some of this coffee roasted in this way and the people who used it said that they could not see or taste any differences from coffee which they paid twice as much for.

PROF. SAYRE:—I suppose you know that roasters of coffee always expect a loss in caffein in the process of roasting. This constituent is sublimed to a greater or less extent in the operation and it is well known that the crude caffein collects on the walls of the coffee roasters and this sublimate is very valuable because of its caffein content,—because of its richness in this alkaloid.

PROF. KREMERS:—I would like to ask whether the acid gives the aroma to the coffee, or aromatic residuent?

PROF. SAYRE:—It is given by the so-called oil which is associated with pyridine. The pyridine like constituent is associated with the aromatic principles or is a part of them. Dr. Nelson has been working with me on this problem. He is at Harvard during the summer and he hopes in the fall to work out the final result as to this toxic constituent which is present only in very minute quantities. We find it has a very close connection with the aromatic or so-called toxic principle.

PROF. KREMERS:—Do you know of any pyridine content, so-called that is suggestive of the aroma of coffee?

PROF. SAYRE:—No, I do not. It is well known that pyridine *itself* is not suggestive of coffee. But it is well known, however, that you can modify odors by certain combinations, especially when they are present in minute quantities.

THE ASSAY OF OPIUM.

A. R. L. DOHME.

There is no more important nor more frequently used assay process in the pharmacopœia than that of opium. There is no drug used in which the monetary value of variation in assay results is greater, for above all other drugs the price of opium is directly determined by and based upon its assayed strength of morphine. There is hence every reason why this assay process of all processes in the pharmacopœia should tell the truth or as nearly the truth as is possible. Hence the great question before the Revision Committee is the process of assay for opium and again this committee is confronted as it was in 1904 by two opposing factions favoring respectively the U. S. P. method which exhausts the opium by water and the lime method which exhausts the opium by the use of lime. Manufacturers of morphine probably know best the relation of assay of drug to yield of manufacture because

they are getting comparative data along this line all the time. It is admitted that about one *per cent.* of morphine is lost in manufacture whether it be in exhausting the opium for making fluid extract, tincture or morphine salt or by oxidation or other change. I have convinced myself that this loss is not due mainly if at all, to incomplete exhaustion as delicate qualitative tests for the presence of morphine in exhausted drug indicate the absence of morphine in practically all instances. Rather is the loss in my opinion due to oxidation or other chemical change of the morphine in the process incident to the exhaustion of the drug or manufacture of same into its respective preparations.

This view is taken by Debourdeaux, (*Jour. Pharm. Chimi., 1912, II, p. 491*) who found that opium is subject to change when stored for any great length of time. The content of water soluble morphine or morphine salt is increased due to some chemical change in the mass.

It is generally admitted that the present U. S. P. opium assay leaves morphine in the mother-liquors which I have been able not only to detect qualitatively but quantitatively by extracting it with immiscible solvents and determining it volumetrically by a process of assay devised by my laboratory, and to be described below. If you know that by the lime process you obtain from an opium 10 *per cent.* of morphine; by the U. S. P. process, as modified by the present Revision Committee, 11.5 *per cent.* and by our method 12.3 *per cent.* of morphine and if you know by your own test that the lime-process mother-liquors contained about 2.25 *per cent.* of morphine; the U. S. P. method mother-liquors contained about one *per cent.* of morphine and the mother-liquors from our process contained practically no morphine, would you hesitate about voting that the lime method is the best method to be adopted for the pharmacopœia? Yet this is the condition that confronts us all as users of the pharmacopœia, for a majority of the proximate assay committee after once adopting the U. S. P. method by a practically unanimous vote reconsidered their action on the motion of one member and then adopted the lime method of Prof. Stevens, the chairman of the committee, by a vote of 5 to 3, with one member not voting. To be sure, the lime method result above given represents the morphine actually obtained and weighed, to which by the proposed method of assay to be made official in the U. S. P. is to be added 1.12 *per cent.* as a correction factor, making the result 11.12 per cent. Kindly remember that they do not and did not propose to add a correction factor to the result obtained by the U. S. P. process, although any one can prove, as we have done, that there is 0.75 to 1 *per cent.* of morphine left in the U. S. P. mother-liquors. If the committee sees fit to use a correction-factor at all, and personally I think it unwise and unscientific as it admits weakness and error on its face and hence induces doubt, should they not, in their comparative assays in justice to the public and the process have used a correction factor for the U. S. P. method? In that event the comparative figures would read, using the same opium:—

Lime method 11.12 *per cent.* morphine.
U. S. P. method 12.25 *per cent.* morphine.

In 1904 the same thing occurred, and I, as chairman of the committee, appealed the matter to the General Revision Committee of twenty-five. Both myself and Prof. Stevens presented arguments and figures to substantiate our positions and the General Revision Committee supported me by a vote of 16 to 9 and

the U. S. P. method and not the lime method became official in the U. S. P. and has been for ten years. At that time and at this time Prof. Stevens censured me for going outside the committee and giving any results or facts of the committee's work to the General Committee or the public. I do not, however, favor star chamber methods in anything and never have, and feel to-day that every result or piece of work done by the Assay Committee or any other sub-committee of the U. S. P. Revision Committee is the property of the general public and should be made known by publicity to that public. I am sure there is no result, work or vote standing over my name in the files of the Revision Committee during the fourteen years I have been a member of it that I am not willing and glad to have made public and, further than that, I do not propose to remain indifferent and let a process of assaying opium that I consider to be inferior be adopted as the official and legal opium assay process for this country by a small majority of a committee. I propose to fight for what I feel convinced is right until I am convinced by incontrovertible arguments that I am wrong and that privilege I am only too glad to grant to any of my worthy opponents.

In the practical part of this paper I have had the kind assistance of Messrs. H. Engelhardt and O. E. Winters of my laboratory.

For the assay of opium 80 different methods have been recommended, many of which, naturally, have only doubtful value. Most of these methods depend on a crystallizing process, that is, the opium is extracted by a suitable solvent and from the solution either as such or in concentrated form after the addition of an alkali, the morphine is allowed to crystallize. In about 50 (that is about 65%) of these methods water is used as a menstruum and from the aqueous solution after the addition of alcohol or ether or acetic ether or a mixture of these and a slight excess of ammonia water the morphine is allowed to crystallize. In about 14 (that is about 18%) of these methods the opium is extracted with lime water, the calcium salt of morphine thus obtained is decomposed by ammonium chloride and the liberated morphine is allowed to crystallize in the presence of alcohol or ether, or of both. The extraction of opium by lime water has several decided advantages, viz:—calcium hydroxide does not dissolve the greater majority of the opium alkaloids such as narcotine, narceine, etc., as well as meconic acid, and by its use many of the resins present in the opium are eliminated. These, however, do not overcome its several disadvantages, the principal one of which is that it does not extract all or as much morphine from opium as the other methods. I may have the most perfectly devised and scientifically accurate method of assaying gold in copper or nitrogen in the air, but if it yields me less than is actually present or is determinable by other methods it has little practical value to the chemist.

Other methods depend on the property of morphine to be easily oxidized and in them certain reagents which are added to the morphine solution are reduced and the reduction products determined volumetrically.

In other methods, the morphine is estimated either colorimetrically or polarimetrically or with potassium-mercuric iodide solution.

The methods in which the morphine is allowed to crystallize have the one great disadvantage, to wit, that, *with the exception of that of the U. S. P.*, the morphine

is allowed to crystallize from too dilute solutions. It is a very well-known fact that morphine is not entirely insoluble in water or in diluted alcohol or in mixtures of water, alcohol and ether, especially in the presence of an alkali. This solubility is naturally materially increased by the presence of resins and is also dependent on the temperature at which the crystallizing liquid is allowed to stand. In most of these methods the proportion of opium to aqueous liquid is about 1 : 10, while in the U. S. P. method the proportion is only 1 : 5; naturally the results obtained by the latter method are considerably higher than those obtained by the other methods, because less morphine is lost by solubility in the mother-liquors.

Experiments to shake out the morphine with a suitable immiscible solvent such as hot chloroform, amyl alcohol, etc., have repeatedly been reported. By these solvents, however, a great amount of the resins is extracted from the opium also, which render the final titration extremely difficult. About four years ago the chemists of the Bureau of Chemistry at Washington worked out some methods by which the morphine was extracted at first with a mixture of alcohol-chloroform and then with chloroform alone. These methods are rather complicated and have to be adhered to in every detail, but the results are quite satisfactory. The shaking out of the morphine is a very tedious process, inasmuch as at times nearly 20 shakings with the solvent are necessary to remove all the morphine from the solution. Later on, Buchbinder recommended shaking out the alkaloid from the alkaline solution with chloroform containing 5 *per cent.* of alcohol. By this modification the shaking out process is shortened considerably.

In 1912, Anneler (*Archiv. der Pharmacie CCL*, page 187) reported on some experiments made in order to estimate the morphine in pantopon, which is a mixture of the various opium alkaloids in the form of their hydrochlorides. He recommended using a mixture of equal volumes of isobutyl-alcohol and chloroform, having found that 100 parts of such a mixture dissolve 1.7 parts of morphine. This menstruum is without doubt the most convenient solvent for morphine, and since the publication of this article we have applied this mixture exclusively in control assays for estimating morphine both in opium, in galenical preparations of opium, in pills, tablets, elixirs, etc., containing morphine. This shaking out process, like all other processes of this kind, has one great advantage over the crystallization process in that by it the total amount of morphine present in the drug or in the preparation is determined, there is no aliquot part feature; at the same time the assay process is a very rapid one and can be carried out, for instance in the case of opium, easily within about five hours. The details of the process which I apply are the following:—

POWDERED OPIUM.

Four gms. of the powdered opium are macerated with water in the regular way either by allowing to stand over night or by shaking for three hours, then exhausting the opium with water and evaporating the combined filtrate and wash-water to about 50 cc. The solution is then transferred to a separator, made decidedly alkaline with caustic soda solution or caustic potash solution which holds the morphine in solution as alkali morphinate. The solution is then shaken out with several portions of 20 cc. each of ether in order to remove the alkaloids of opium other than morphine, which are present in the free state. The alkaline

solution is then acidulated with sulphuric acid to convert the morphine into morphine sulphate, made again *slightly* alkaline by the addition of ammonia water and is then extracted by adding several portions of a mixture of equal volumes of chloroform and isobutyl-alcohol, until all the alkaloid is removed. The isobutyl alcohol-chloroform solutions are then filtered into a distilling flask, the filter paper washed with fresh isobutyl alcohol-chloroform, the chloroform distilled off under ordinary conditions and the isobutyl-alcohol later under diminished pressure. If the original mixture is distilled under diminished pressure bumping very frequently takes place. This can be avoided by first distilling off the chloroform under ordinary pressure. The residue in the flask is taken up in an excess of standardized acid; the acid solution is well diluted with water, and, after the addition of a few drops of methyl red, the excess of acid is titrated back with standardized alkali. From the amount of acid used, the morphine is calculated volumetrically.

For the assay of *Gum Opium* the following modification should be used: 20 gms. of opium representing an average sample of as many balls is exhausted in the regular way by means of water, the combined aqueous liquids are made up with sufficient water to obtain 500 cc., and 100 cc. of this solution are subjected to the assay process. Thus a fairly representative sample of the opium can be obtained. We append below some comparative results on the same drug by the two methods.

Gum Opium U. S. P. Method		*Gum Opium Shaking Out Method*	
Sample I	11.34%	Sample I	12.89%
			12.80%
Sample II	11.37%	Sample II	12.35%
			12.29%
Powdered Opium U. S. P. Method		*Powdered Opium Shaking Out Method*	
Opium A	12.24%	Opium A	13.86%
Opium B	11.7 %	Opium B	13.25%

The assays were made in duplicate by two chemists. In order to find out whether or not the method works in the hands of a worker entirely inexperienced with the method, the opium assaying 12.24 *per cent.* of morphine by the U. S. P. method was estimated by this chemist who found 13.58 *per cent.* of morphine, a figure not varying too much from 13.86 *per cent.* as found by the other two chemists.

AS APPLIED TO TINCTURE OF OPIUM.

From 25 cc. of the tincture, the alcohol is expelled by heating; the residual liquid acidulated with sulphuric acid, the solution filtered into a separator and the filter and residue washed with small portions of water until the combined filtrate and wash-water measure 50 cc. This is then treated as the concentrated aqueous extract in the powdered opium assay.

By this process the following comparative results were obtained on the same laudanum sample:—

U. S. P. Method	*Shaking Out Method*
1.23% morphine	1.33% morphine

I have frequently applied the shaking-out method for estimating the morphine in unfinished tinctures of opium, i. e., the strong tincture before being diluted to

the standard. From the amount of morphine obtained I deducted 10 *per cent.* (approximately the amount found in excess over the U. S. P. method by the shaking-out method) and according to the difference thus obtained I diluted the tincture. I invariably found that the tincture thus diluted answered the requirements of the U. S. P. very well. This procedure has saved us a great deal of time in the course of the year we have been using it, since the shaking-out process can easily be carried out in three hours, while the U. S. P. process takes at least 24 hours.

AS APPLIED TO FLUIDEXTRACT OF OPIUM CONCENTRATED.

Five cc. of the fluidextract (four times the strength of the tincture) is deprived of its alcohol by evaporation, the liquid is then acidulated with sulphuric acid and filtered into a separator. The residue on the filter is washed well with several portions of water until the combined filtrate and wash-water measures about 50 cc The assay is then carried out as in the case of the tincture.

AS APPLIED TO FLUIDEXTRACT AND TINCTURE OF OPIUM CAMPHORATED.

The isobutyl alcohol-chloroform method is especially useful in assaying preparations containing only a small amount of opium such as fluidextract of opium camphorated and paregoric. For assaying the fluidextract 25 cc. are used and 50 cc. for estimating the morphine in paregoric. The process is almost identical with that given under fluidextract of opium. Most of the benzoic acid and camphor is eliminated on evaporation and filtering. Any benzoic acid left in suspension does not interfere with the estimation. I append a few results obtained in assaying these camphorated products.

FLUIDEXTRACT OF OPIUM CAMPHORATED.

(Eight times the strength of paregoric without removing the benzoic acid entirely.)

Lot A 0.346% morphine (theoretical strength 0.384%)
Lot B 0.390% morphine (theoretical strength 0.384%)
Lot C 0.372% morphine (theoretical strength 0.384%)

Removing the suspended benzoic acid by first shaking out the acid alkaloidal solution with ether, I found in the same products:—

Lot A 0.374% morphine (theoretical strength 0.384%)
Lot B 0.361% morphine (theoretical strength 0.384%)

Tincture of Opium Camphorated (Paregoric).

Lot D 0.052% morphine (theoretical strength 0.050%)
Lot E 0.056% morphine (theoretical strength 0.050%)

As applied to Extract of Opium.

0.5 gms of the extract was dissolved according to the directions of the U. S. P., the aqueous solution was evaporated to about 50 cc. and the process was then carried out as described under tincture of opium. The results of the assays follows:—

	U. S. P. Method	*Shaking-out Method*
Lot F	18.63% morphine (theo. str. 20%)	20.4% morphine
Lot G	20.04% morphine (theo. str. 20%)	21.7% morphine

As applied to Tablets.

Dr. Engelhardt (*D. A. Apoth. Ztg., 1912,* January and February), has reported in detail on the usefulness of the shaking-out method in assaying morphine sulphate tablets. We have made a number of additional experiments in this direction, and we have also assayed tablets of complex composition, containing morphine salts combined with other drugs. We have found that the shaking-out method gives rather good results with tablets containing other alkaloidal extracts, provided the alkaloids present in these extracts are soluble in ether. It would be beyond the scope of this paper to give in detail all the results which we have obtained. We feel convinced, however, that the shaking-out method is the best yet proposed for quantitatively determining morphine in tablets.

As applied to Pills.

Pills, both simple and complex, can be assayed just as conveniently as tablets. The diluents in the pill mass do not apparently interfere with the accuracy of the assay. For instance, we have applied the shaking-out process to Neuralgic, Gross, N. F. pills which as is well known contain in addition to 1/20 gr. morphine sulphate, 2 gr. quinine sulphate, 1/30 gr. strychnine, 1/20 gr. arsenous acid and 1/2 gr. extract aconite leaves. When applying the shaking-out process, described in this paper, we found the pills to contain 1/23 gr. morphine sulphate, a result which without doubt is very gratifying considering the large proportion of other alkaloids present in the preparation.

We have also applied the shaking-out process to morphine preparations containing a comparatively small amount of the alkaloid, for instance, to Elixir Morphine Aromatic which contains, in addition to several other ingredients one grain of morphine sulphate per fluid ounce. By the isobutyl alcohol-chloroform shaking-out method we found in three different lots of this .936 grain, .938 grain and .94 grain of morphine present in one fluid ounce. The shaking-out method can be applied also with advantage to other substances containing small amounts of morphine, such as poppy heads and preparations thereof.

From an experience of more than a year with the shaking-out method using isobutyl alcohol-chloroform as immiscible solvent, we cannot too strongly recommend this method and we trust that many other chemists will try this method and publish their findings or let us hear from them. It is our conviction that the shaking-out method will eventually be made official in the U. S. P. in order to save time and to estimate the *total amount* and correct amount of morphine present in the drug or in its galenical preparation without using correction factors or aliquot parts. As has been pointed out in the first part of this paper all the methods which have been recommended for the estimation of morphine give results that are too low and that vary too much, due to the varying amount of morphine remaining in solution in the crystallization liquid.

In closing, I would like to mention that we devised and worked out this shaking-out method only after most of the assay work on opium of the Proximate Assays Committee had been completed. In fact, I had practically voted to adopt the U. S. P. process as revised by the committee. When the reconsideration of this action came up, I suggested trying the shaking-out method in comparison with the other two methods before the committee, viz., the U. S. P. and lime methods. It received little or no consideration, however, the Proximate Assay Committee

being unfavorable. The stage was set for lime versus U. S. P. and no one could see the shaking-out process.

In conclusion, I think I have proved that:—

First:—The lime method is inferior in every sense, except shorter time of operation, to the U. S. P. method, and is not worthy of adoption in the pharmacopœia of this country.

Second:—That the shaking-out method devised by us is superior in every sense, will eventually be adopted in the U. S. P. and should be adopted now. If not adopted now, then the modified U. S. P. should be adopted by the Revision Committee.

Third:—That the shaking-out process is adapted to determining morphine in practically all kinds of mixtures as well as practically all forms of medication.

Analytical Laboratory, Sharpe & Dohme, August, 1914.

THE LIME ASSAY OF OPIUM.

A. B. LYONS, M. D.

Of the numerous methods that have been proposed for the morphiometric assay of opium, two only seem to have found favor with the authors or compilers of national Pharmacopœias.

In one, the drug is exhausted with water, the solution concentrated to a small volume, alcohol and ether added together with water of ammonia, the mixture shaken well and allowed to stand for a specified time for separation of the morphine in crystals.

In the other, the powdered opium is mixed with lime and a certain proportion of water, allowed to macerate, with occasional stirring during half an hour, the solution filtered and an aliquot portion of the filtrate treated with ammonium chloride which causes the morphine to separate in crystalline form.

The advantages claimed for the second method are (1) rapidity of execution; (2) superior purity of the morphine obtained, owing partly to the fact that lime combines with morphine forming a very soluble compound—a property not shared with it by narcotine or most of the other alkaloids of opium—partly because the lime throws out of solution certain organic acids and other compounds which otherwise are liable to be thrown down with the morphine; (3) alleged uniformity of results.

Against the lime method it is urged: (1) It involves unavoidably the principle of the aliquot part; (2) crystallization of the morphine is from a more dilute solution than in the first general method, hence more of the morphine is held in solution so that an arbitrary correction is generally prescribed to compensate this loss. (It is generally admitted that there is also loss of morphine in the first assay method, in which no correction factor is generally prescribed;) (3) the assay requires that the opium be in the form of a powder, whereas

opium is imported in a moist condition, so that it must be dried (the loss of weight noted) and reduced to a powder—operations which greatly lengthen the time required for an assay.

Before entering into any discussion of these claims and counter claims, it is necessary to enter more in detail into the particular method of carrying out the respective assays. A typical lime assay process is that of the French Codex. Somewhat simpler and more familiar to American pharmacists is the Stevens assay. In the latter four grammes of powdered opium are mixed with two grammes of calcium oxide, the powder made into a paste with 10 cc. of distilled water, 19 cc. more of distilled water are added and the mixture is stirred occasionally during half an hour. The magma is then transferred to a filter and exactly 15 cc. of filtrate is taken for the assay, assumed to represent 2 grammes of the opium. To this is added 4 cc. of alcohol, 10 or 15 cc. of ether and 0.5 grammes of ammonium chloride. The mixture is shaken frequently during 30 minutes, then allowed to stand over night to complete the crystallization. The crystals of morphine are then collected in a small funnel loosely plugged with absorbent cotton, washed with morphinated water, transferred to the flask in which the crystallization process was carried out, the morphine being finally determined by titration with volumetric acid and alkali.

The first question that arises is as to the accuracy of the aliquot part taken. This will depend on the increase in volume of the fluid, due to the dissolved extract and lime. A number of experiments made with several different samples of opium have showed that where slaked lime is used, the increase in volume over 29 cc. is about 0.6 cc. covering a range from 0.5 to 0.75 cc. In the assay, the increase is taken as 1 cc. and the allowance thus made for incomplete exhaustion of the drug, amounting to from 0.8 to about 1.7 *per cent.* of the total may be considered reasonable. It is considerably less than the allowance in the assay process of the French Codex, and in other official processes. It is to be noted, however, that if calcium oxide is used instead of calcium hydroxide, this allowance is increased to 3 *per cent.* or more, since the oxide combines with and fixes one equivalent of water.

It is sometimes difficult to obtain a filtrate measuring as much as 15 cc. In such case, the filter containing the residue may be enclosed in a small piece of cheese cloth or muslin, and the residual fluid pressed out and then filtered through a small filter.

Measurement of the 15 cc. of filtrate must be made as accurately as possible —best with a measuring pipette. Of course, exposure of the filtered solution to air, particularly to the air exhaled from the lungs, must be minimized, by receiving the filtrate in a small flask, keeping the funnel covered with a watch glass and conducting the filtration as rapidly as possible to guard against any precipitation of calcium carbonate.

It is a question whether addition of any alcohol to the filtrate is advisable. Larger and whiter crystals of morphine are formed if the alcohol is added, but the separation of the morphine by crystallization under the ordinary conditions of the assay, is certainly less complete than if the alcohol is omitted. A careful study ought to be made of the influence (a) of alcohol, (b) of temperature,

(c) of the amount and kind of shaking, and (d) of the quantity of ether added. It should be understood that when morphine is set free in presence of ether or of a mixture of ether and alcohol, the alkaloid is largely transferred in the shaking to these solvents, and that at the end of the crystallization, the residual morphine will be found chiefly in the ethereal fluid.

I have found by experiment that when ether alone is used the residual morphine, after 14 hours, is almost a negligible quantity. When alcohol is present a notably larger quantity is held in solution. Whether it is possible to determine to a close approximation just how much of the alkaloid will be held in solution under prescribed conditions of shaking, temperature and time, can only be ascertained by a series of experiments. Inasmuch as the loss of morphine, where only ether is used, is inconsiderable, it seems to me unwise to use the alcohol—unless it can be shown that other alkaloids are thus prevented from crystallizing with the morphine, of which there seems to me practically no possibility.

Stevens' method of collecting the morphine and determining it by titration is neat, rapid, and I believe beyond criticism.

When the lime assay is carried out, as above detailed, the possible sources of fallacy are reduced to the following: (a) possible failure to extract the whole of the morphine by the half hour maceration; (b) possible presence in the morphine of other alkaloids; (c) possible inexactness of the aliquot part of the lime solution; (d) possible inexactness in the *titre* of the volumetric solutions used.

(a) It is not unlikely that in inexperienced hands there may be failure to extract the whole of the morphine in the initial maceration. It is my belief that if the directions for extracting the opium are carried out with reasonable care, practically the whole of the morphine will go into solution, but it is not easy to determine this experimentally. Results of comparative assays by the lime and aqueous extraction methods are not conclusive, particularly when such results have been reached in coöperative investigations.

In case it should be made to appear that powdered opium is not always completely exhausted in the prescribed routine a different procedure might be adopted in which the opium would be first exhausted with water, as in the U.S.P. assay. This, however, would sacrifice the great advantage of economy of time in the lime assay. It would, on the other hand, make the lime assay applicable to moist crude opium and with only slight modifications to all galenical preparations of opium, except the camphorated tincture.

(b) Presence in morphine separated in the lime assay of by-alkaloids could hardly be expected considering the manner in which the alkaloid is separated. At all events, alkalimetric titration indicates a high degree of purity in the crystals. The French Codex directs to wash the crystals with benzene (benzol) to remove such possible contamination. I do not think the precaution is necessary, but I have not tested the question experimentally whether benzene will reduce the weight of the crystals.

(c) The question of exactness of the aliquot, I have already considered. Of course, it is important that measurements of the water and the lime solution

should be made with exactness, and that the temperature at which these measurements are made should be practically the same, though not necessarily 25° C., the official standard temperature.

Greater exactness can, of course, be secured by weighing the fluids instead of measuring them. If this is done a certain arbitrary allowance must be made for dissolved lime and extractive. It would be safe to make this allowance one-third the weight of the opium present, i. e., for a quantity of solution representing 2 grammes of opium, 0.667 gm. If 4 grammes of dry opium have been treated with 29 grammes of water, the aliquot representing 2 grammes of opium will be $14.5 + 0.667 = 15.167$ grammes of the lime solution.

(d) To secure exactness in the result of the titration, it is only necessary to standardize the volumetric acid used on pure recrystallized morphine, dried over sulphuric acid. The conditions of the titration as to dilution of solution, etc., should be practically the same as in the assay; it is particularly important that the same indicator be used. For the professional chemist whose laboratory equipment is complete, there is no difficulty about so simple a matter as making an alkaloid determination by titration. In absence of such advantages a routine may be adopted which insures exact results in spite of difficulties.

One must be sure in the first place of the exact neutrality of the distilled water to be used. Put into a small flask a sufficient quantity of the water—which, although distilled, may have absorbed traces of ammonia, or if acid vapor—add a few drops of the indicator, and if necessary bring to exact neutrality by adding very dilute acid or alkali. To dissolve the morphine use this neutral distilled water with the addition of the requisite quantity—say 10 cc.—if decinormal hydrochloric acid, very accurately measured. For alkali, use half strength lime water, i. e., lime water diluted with an equal volume of distilled water (which need not be strictly neutral), and filtered if necessary. Ascertain the exact strength of this solution by titrating with it 10 cc. of the volumetric acid, diluted with some of the neutral water previously prepared. If it requires 46.5 cc. of the diluted lime water, then $46.5 \div 10 = 4.65$ cc. of the alkali correspond with 1 cc. of decinormal acid. If the titration of the excess of acid after solution of the morphine, has consumed 38.45 cc. of the diluted lime water, deduct this figure from 46.5 and divide the remainder by 4.65. The quotient (1.73) represents the value in decinormal terms of the excess of acid. Hence, the morphine has required for neutralization $10.00 - 1.73 = 8.27$ cc. of decinormal acid, of which each cc. represents 30.3 milligrams of morphine, and $8.27 \times 30.3 = 250.581$ mg. is the quantity of morphine indicated by the titration.

If an aqueous solution (from any form of opium, or from a galenical preparation of that drug) is to be assayed by the lime method, it is to be brought to such a concentration that 30 cc. of it will represent 4 grammes of opium, 2 grammes of dry slaked lime are to be added, the mixture allowed to stand with occasional shaking 20 minutes, filtered and 15 cc. of the filtrate taken for the assay, to be conducted exactly as above described. In case the opium preparation contains alcohol, this must be driven off by evaporation on the water-bath. The official tincture may advantageously be diluted with twice its volume of water, the mixture, after standing 20 or 30 minutes, filtered and an aliquot part of the

filtrate, representing 4 grammes of opium evaporated to a volume of 30 cc. Otherwise 40 cc. of the tincture, after addition of about 20 cc. of water, may be evaporated until alcohol is dispelled, the concentrated solution transferred to a cylindrical graduate, the container rinsed with successive small portions of water to bring the volume of the fluid to exactly 30 cc.

Experiments should be made to ascertain whether at a low temperature (15° C. or below) crystallization of morphine in the final operation is practically complete in six hours, or in four hours even, provided the mixture is shaken continuously during 10 minutes, or at frequent intervals during 30 minutes after the ammonium chloride is added. (Note that the quantity of the latter salt must not exceed 0.5 grm.; 0.3 gm. should be sufficient.)

Just how the assay would be affected by the accidental presence of a notable quantity of sugar, is an interesting query. Of course, it would increase the amount of lime taken into solution and would therefore, call for a larger quantity of ammonium chloride, which again might cause a larger proportion of morphine to be held in solution.

Advocates of the Squibb assay method argue that that process should be preferred to the lime method for the following reasons: (1) The yield of morphine is greater; (2) the process is not complicated by the use of an aliquot part; (3) crystallization of the morphine is from a more concentrated solution, and hence should be more complete; (4) no arbitrary correction of the result is required; (5) the morphine is obtained in bold crystals, which, by titration, are shown to be free from any considerable impurity; (6) the assay is free from the sources of possible error to which the lime assay is subject—particularly,

Advocates of the Squibb assay method argue that that process should be maceration in the initial steps.

In rejoinder, advocates of the lime process say:

(1) Deficiency in morphine yield is not unavoidable in a lime assay. It has resulted chiefly from remedial defects in the details of the lime assay as generally practiced. Two main causes have been the use of alcohol, as well as ether, to facilitate crystallization and the prescribing of too large a quantity of ammonium chloride. Besides this, due attention has not been given to the temperature during crystallization and to the amount and method of shaking prescribed. It is well known that in the Squibb method, emphasis is laid on vigorous and prolonged shaking, and results are greatly influenced by neglect of this detail.

I am sure that the same opium solution assayed by the lime method, as hereinbefore described, yields practically the same quantity of morphine as by the Squibb assay. I am not equally positive that the lime method applied to opium in powder will give results correspondingly close to those of the Squibb assay, although it is my belief that they will. If so, the great saving of time and labor demand giving preference to the lime assay.

(2) The aliquot part, which is freely used in other assays, does not condemn an assay process. I have shown that for practical purposes, the aliquot of the Stevens assay (if calcium hydrate is used in place of calcium oxide) may be accepted as reasonably exact. If greater accuracy is wanted, it is easy to weigh the fluids instead of measuring them.

(3) It is apparently true that crystallization in the lime assay is from a more dilute solution than in the Squibb assay, but the conditions for crystallization are more favorable after all, in the former case. It is to be remembered, too, that the crystallization takes place in either case rather from the ethereal than from the aqueous solution. Experiments have shown that residual morphine, under proper conditions, is likely to be less in the former case than in the latter.

(4) If the last statement is true, an arbitrary factor is as necessary in one assay as in the other, the difference in amount being likely to be in favor of the lime process, and compensated at that by a negative correction in the Squibb assay for impurities in the crystals of morphine.

For practical purposes, the small correction may be ignored as immaterial, provided one or the other of the methods in their most approved form be taken as a basis for the commercial valuation of the drug.

(5) Where determination of the morphine is to be made by titration rather than by weighing, the smaller crystals are preferable, as being more quickly dissolved.

(6) The sources of possible error in the lime assay have already been shown to be inconsiderable and largely avoidable by slight modifications in the detail of the assay process. Loss of water by evaporation need not occur to any appreciable extent if obvious precautions are taken.

Confessedly neither of the assay processes under discussion are capable of yielding results of a high degree of exactness. The problem of singling out one from a number of alkaloids which exist in combination with a complex mixture of organic substances, and separating this in a reasonable state of purity by a simple and easily executed process is a baffling one indeed. The lime assay gives the neatest solution we are likely to reach.

Otherwise we may remove, by suitable solvents, the other alkaloids and then by some other solvent to take out the morphine in a state of purity. More than one process involving this principle has been devised—notably the Gordin-Prescott method, in which the solvents employed are successively benzole and acetone, and several shaking-out methods that have been strongly recommended in recent years, in which by-alkaloids are removed from a lime solution by shaking with chloroform, the morphine being afterwards set free by addition of ammonium chloride and separated by shaking out with alcohol, chloroform or some other solvent.

Presumably the results obtained are more nearly exact than those by the process now official, but until they have been put to the test of actual use under varying conditions, it is best to use them only tentatively and as confirmation of results more easily reached by the more familiar process.

DISCUSSION.

HARRY M. GORDIN, of Chicago:—There are two difficulties in the lime method. One is that the final liquid is so deeply colored that the end-point in titration cannot be clearly observed. This, however, can be eliminated by a method which I shall publish in the near future.

The second difficulty consists in that the vacuum distillation usually is accompanied by such violent bumping that some of the liquid may be lost by being thrown out of the distilling flask. How did you avoid this difficulty, Dr. Engelhardt?

DR. ENGELHARDT:—As I pointed out already this latter difficulty can easily be overcome

by first distilling the chloroform under ordinary pressure and then distilling the isobutyl-alcohol under diminished pressure. While doing so bumping will never occur.

MR. CHARLES E. CASPARI:—With reference to these methods for the isolation of morphine from opium. The lime method does not yield all the morphine which is present in the opium. While it may be all right for comparative purposes, it does not give absolute knowledge of the actual amount of morphine which is present, either in opium, or opium preparations, which ever may be under examination.

I have had some experience with the method of shaking out with chloroform and alcohol. a modification of Dr. Engelhardt's method, as presented here, and I have found it to yield immediate and certain results, and I have been very much pleased with it. I have used it particularly on tablets,—morphine mixed with other ingredients—and found that it was very satisfactory.

From my knowledge of the methods, I would say that I like the shaking-out method best. It is the simplest, and quickest, and as far as I can determine, the most accurate.

MICROSCOPY OF CINCHONA BARKS AND ADULTERANTS.

C. W. BALLARD, M. A., PH. C., PHAR. D.

The question of the identity, both macroscopic and microscopic of the various species and varieties of cinchona, has been one of great importance for many years. The difficulties in the way of proper identification, are increased greatly, by the necessary admission of many hybrids of the official species. Of course, the drug is to great extent sold upon assay, but this does not relieve the pharmacognosist of the task of deciding, whether a sample submitted, is official or recognized, as there is always the possibility of the addition of non-official barks to a lot of genuine, and the more likely is such addition, when the drug is in powdered form. The chemistry of cinchona has been treated at great length in the proceedings of this Association, and, likewise, several papers have been submitted upon the macroscopic or gross appearance and structure of the drug, but, in a search of the publications, I fail to find much reference to the microscopy.

The results, in many cases, are not quite as definite and satisfactory as I would desire, and this lack of absolute uniformity, is undoubtedly due to hybridization in cultivation. An excellent article upon the subject of cinchona is given by Vogl, in his text book on Pharmacognosy (German), but this is not accessible to all, as I do not know of an English translation of the work. For this reason, I append a useful classification of the histological characteristics of the various cinchonas taken from this text book. (Dr. A. Vogl, *"Pharmacognosie," Carl Gerold's Sohn, Vienna,* 1892.)

Macroscopic characteristics are treated at length by so many authorities that no reference will be made to them, excepting, if necessary, to more fully explain microscopic structure. I append a list of the literature available at the library of Columbia University College of Pharmacy upon the subject. A further list, and one which is complete up to the date of publication, is given in the English translation of Fluckiger's "Cinchona Barks," by F. B. Power (Blakiston, 1884). In this connection, I would make special mention of a folio volume in French, *"Historic Naturelle des Quinquinas,"* M. H. A. Weddell, 1849, which contains excellent illustrations in natural color of many specimens.

CINCHONA CALISAYA AND CINCHONA LEDGERIANA:—As these two species are found to comply with the official requirements as regards alkaloidal content, we may for purposes of comparison consider them as standard. For descriptions and illustrations of histological structure, we cannot do better than consult the material given under the head of Cinchona in the following references: Vogl, *"Pharmacognosie"*; Vogl, *"Atlas zur Pharmacognosie"*; Moeller, *"Pharmacognosticher Atlas."*

As will be ascertained by the above references, the histological elements found in powdered Calisaya or Ledgeriana barks are: cork, flat, thin-walled, with brown contents; parenchyma, thin-walled, containing starch and crypto-crystals; characteristic bast fibers; medullary ray tissue; thin-walled tissue of laticiferous ducts; tissues of the lichens attached to the bark.

Cross sections of barks of both these species, exhibit the following picture. An outer corky layer, brown in color, composed of flat quadrangular cells, the outer portions being very thick, and not being as distinct to view as the inner part. Below the cork is the parenchyma of the middle bark containing numerous bast fibers either isolated from one another or in groups of two to five. In this parenchyma will be found cells containing crypto-crystals and a few containing small starch grains. The laticiferous ducts in this region are circular, thin-walled and rather larger than the parenchyma cells. Coming to the inner bark, we notice the medullary rays made up of flat rectangular cells with long axis toward the cork, these being usually one to three cells in width. Between them are located the bast fibers, for the most part in groups of four or more. The parenchyma of this region, is composed of small cells, a few of which contain starch. By some authorities, stone cells are said to occur in the middle portion of these barks, but they were not found in the specimens examined.

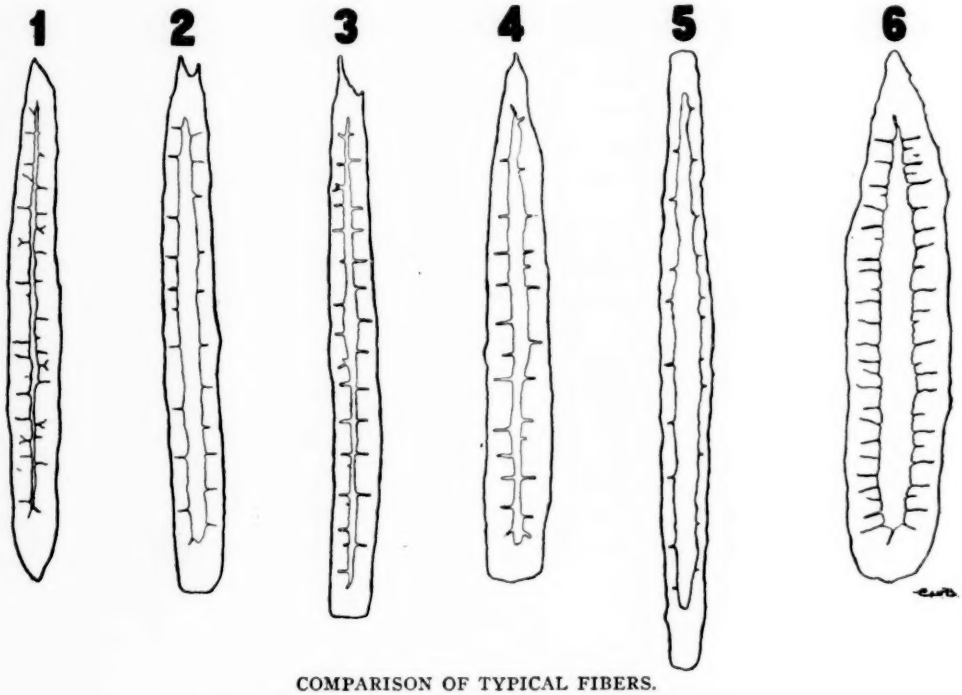
Cinchona Ledgeriana possesses a larger quantity of bast fibers than Calisaya. The bark parenchyma also contains starch of moderate size, whereas calisaya parenchyma contains very little starch, and that which is present is very small. In many of the bast fibers of Ledgeriana, the ends are double pointed, whereas all other species have single pointed ends.

The indentations or pores of the inner wall of the bast fibers of Calisaya and Ledgeriana are somewhat deeper than those of Succirubra, but are not as broad The cavities of the fibers in Calisaya and Succirubra are about the same size, but those of Ledgeriana are generally much larger. The bast fibers of all three, are striated in a direction parallel to the length of the fiber, but the striations of Ledgeriana, are fewer and coarser than in the other two. In many instances in Calisaya, the pore begins at the cavity as a single narrow opening, but, upon penetrating the wall of the fiber for a short distance, it separates or branches out into two parts. While there are double pores in Succirubra, the opening from the cavity is very wide, usually wider than the pore itself.

CINCHONA SUCCIRUBRA:—In a cross-section of succirubra bark, we have the outer layer of cork similar to that in the preceding species. The middle bark consists of thin-walled parenchyma cells, containing much starch and many crypto-crystals, and within this parenchyma are laticiferous ducts which are very large. Very few bast fibers are present in this region. In the inner bark are found the medullary rays and bast fibers, the latter usually in groups running parallel to

the rays. The rays are usually three cells in width and are almost parallel to one another.

In the powder, the bast fibers are the most prominent element, being more numerous and rather more slender in this variety than in Calisaya. The fibers are striated, but the striations are coarser than Calisaya. Three types of fiber were noted: those with both ends sharp-pointed; those with one end square and the other pointed; the third with one end square, the other being square excepting for a projecting point, similar to the peculiar fibers of Ledgeriana except that those of the latter have a double point. The variety with one narrow projecting point predominate. The indentations of the inner wall, are wider but not as deep



COMPARISON OF TYPICAL FIBERS.

1. Cinchona calisaya.
2. Cinchona ledgeriana.
3. Cinchona succirubra.
4. Cinchona officinalis.
5. Cuprea Bark.
6. Maracaibo Bark.

as those of Calisaya and Ledgeriana. There are, in many fibers, double pores which have wide openings from the cavity, thus distinguishing them from Calisaya.

One fact noted, was that the parenchyma of this variety, is for the most part filled with starch; also the total amount of starch in the field is considerably greater than in Calisaya or Ledgeriana. This feature, although not an altogether certain and definite one, may furnish a clue to the derivation of a sample.

One other element which may be found in this variety and which may be rather confusing at times is lichen tissue.

CINCHONA OFFICINALIS *(Loxa Bark)*:—The transverse sections of specimens of this variety exhibit an outer corky layer, to which lichens may be adherent.

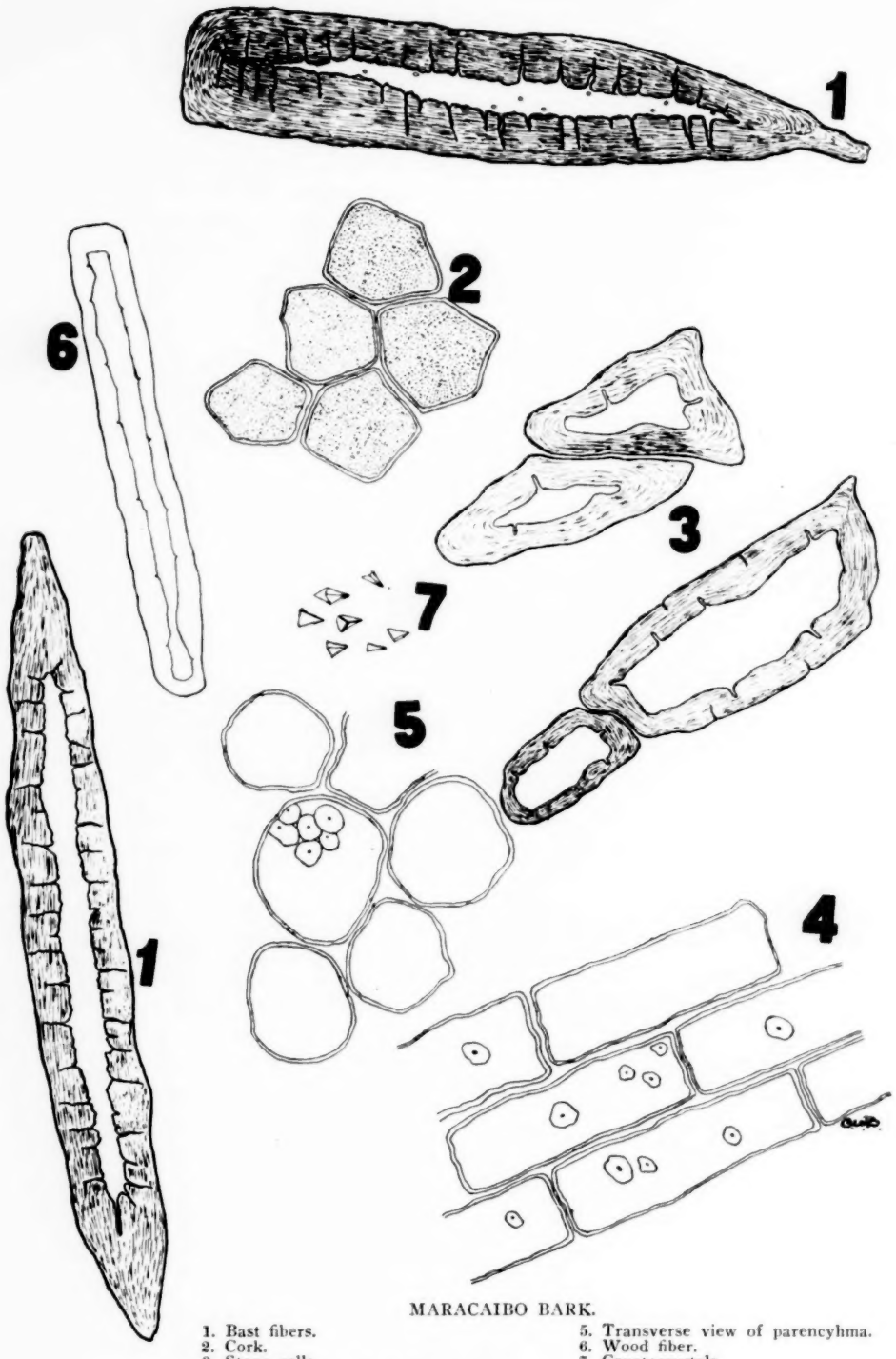
The cork cells are of the usual type, rectangular, small, thin-walled and brown. Below the cork is the parenchyma of the middle bark containing a few small laticiferous ducts. Bast fibers, if present in this region, are very few in number. In the inner bark, occur the medullary rays composed of large rectangular cells, each ray running parallel with the others and being somewhat wider as they approach the middle bark. These rays are two cells wide in the inner bark, but expand to three or four cells in width, upon reaching the middle region of the specimen. Between the rays occur bast fibers, singly or in groups of two to four, and have very small cavities. The remaining space between the rays, is filled in with the bark parenchyma interspersed with the sieve cells.

The powder of C. officinalis contains the usual elements found in the true cinchonas. The fibers and parenchyma are of about equal prominence. The structure of the cork cells is easily seen, but the fibers are not as numerous as in the other official varieties. In a majority of cases, they are flattened at one end and sharp pointed at the other, although a few are pointed at both ends. The cavity is very narrow and the indentations or border pores, which are in all cases single, extend to the outer margin of the fiber. Striations are found running parallel to the long axis of the fiber. The parenchyma in the powder, is usually in very good condition and is always more or less filled with small starch grains and small crypto-crystals. Medullary rays are large and easily seen in the powder, the individual cells being rectangular and occurring in groups attached to the fibers.

CUPREA BARK *(Remijia pedunculata)*:—This substitute for the genuine cinchonas, is not entirely worthless, although of an entirely different genus. It contains some cinchona alkaloids, and is therefore more likely to escape detection during assay processes.

The cross-section of this bark shows a few layers of thick-walled brown cork cells at the outer margin. The middle bark contains groups of characteristic, yellow, stone cells, large and moderately thin-walled, usually filled with starch or reddish-brown contents. Laticiferous ducts are said to occur in some specimens, but I did not observe them in two out of three specimens examined. The inner bark contains the medullary rays and groups of densely-packed, small, but thin-walled bast fibers. The rays are very irregular as regards direction and width. In many cases they are wavy and not parallel with each other or extending through the bark at right angles to the cork, as in genuine barks. The individual cells of the rays are rather long, and either rectangular or circular, being filled with reddish contents, making them much darker than the surrounding cells. In many specimens, the rays broaden out upon reaching the middle bark, as in C. officinalis and merge almost imperceptibly with the parenchyma of this region. In width, the rays vary from one to four cells. The bark parenchyma and sieve-tissue of the inner bark, is almost entirely displaced by the densely-packed bast fibers.

The powder of this variety, is characterized by numerous stone cells and bast fibers, square or rounded at the ends, and occurring in groups arranged end to end. Their walls are very thin and the cavities of these fibers are large, but the inner walls are not, markedly, indented as in genuine species. The stone cells



MARACAIBO BARK.

1. Bast fibers.
2. Cork.
3. Stone cells.
4. Longitudinal view of parenchyma.
5. Transverse view of parencyhma.
6. Wood fiber.
7. Cryptocrystals.

are square, or polygonal, with a few circular shape, finely striated with deeply-indented inner margin. Some are filled with starch, others with reddish-brown contents. The medullary ray tissue, is very prominent in the powder both in longitudinal and transverse section. It is adherent to the short fibers and the bark parenchyma. Many of the parenchyma cells are filled with starch. Crypto-crystals are present in this powder, but are less numerous and smaller than in the genuine barks.

The peculiar fibers render this adulterant very easy of detection, and the stone cells render such finding certain.

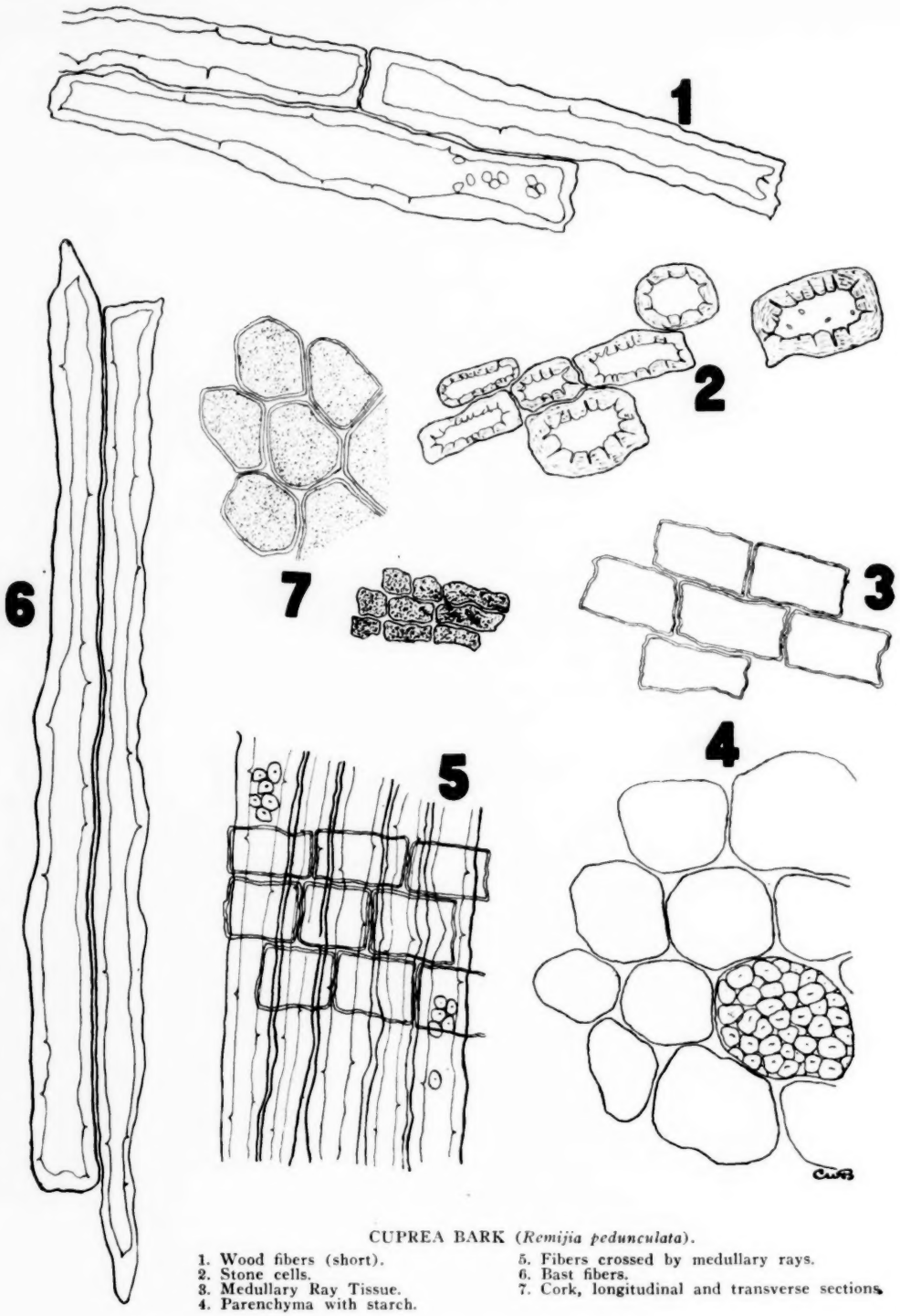
MARACAIBO BARK:—Maracaibo bark has been used very recently as an adulterant of the yellow cinchonas, especially that sent to market in chip form. It is not, in any sense, a purely theoretical adulterant, or one which might be thought to be of use for nefarious practice, for several samples of cinchona have consisted in part, and in some cases the greater part, of this spurious bark. Its botanical origin seems to be rather obscure, and it is not mentioned under the above commercial name in most scientific works.

The transverse section of most samples, shows very little corky tissue, as this peels away very easily. The middle region of the bark, contains many groups of large thick-walled yellow fibers and few yellow stone cells. Laticiferous ducts are also present. The parenchyma is of small irregular brown thin-walled cells. The inner bark consists of very small, and dark-colored medullary rays, usually two cells in width; the rows being comparatively far apart as compared with all other barks. Between the rays, we find groups of large, yellow bast fibers and rather large quantities of small, irregular thin-walled parenchyma. The fibers are wider than any other related bark, but are not as numerous as in *cuprea*.

In powdered form, the bast fibers are, as in the true cinchonas, most prominent. They are considerably wider than fibers of the true species, and are very coarsely marked with striations running parallel to the outer margin. Both ends of the fibers are sharp-pointed. The cavity is very large, and the indentations extend almost completely to the outer margin of the fiber. The wood fibers which are present, are about as long as the bast, but are very slender, thin-walled, with square ends and filled with reddish-brown contents. The stone cells are large, triangular or rectangular in shape, yellow in color, with thick walls. The cavities of these stone cells are marked by many indentations or pores and they may be filled with starch. Numerous well defined crypto-crystals are present, many of them being very large.

RENEWED BARK:—A transverse section was prepared from a sample of the so-called renewed bark, and examined to discover any changes brought about by the renewing-process. This renewing, or stripping, of the outer bark from the tree, and the covering of the bared places, with moss or material to prevent access of light, is said to yield a bark much higher in alkaloid than the ordinary.

In renewed bark, the thick, brown, corky layer is of course absent, although a small amount may remain. In the region which, in an untreated bark, would correspond to the middle bark, we find at the outer edge several rows of flat, almost perfectly rectangular cells, resembling cork but not deeply-colored; they representing secondary cork formation. Below this secondary cork, is a wide



CUPREA BARK (*Remijia pedunculata*).

1. Wood fibers (short).
2. Stone cells.
3. Medullary Ray Tissue.
4. Parenchyma with starch.
5. Fibers crossed by medullary rays.
6. Bast fibers.
7. Cork, longitudinal and transverse sections.

zone of circular parenchyma cells, in which remains of the previously existing medullary rays may sometimes be seen. A few small laticiferous ducts are also present in this region, but bast fibers are entirely wanting. In the region corresponding to the inner bark, are the true medullary rays, two or three cells in width, and of large but narrow cells. The bast fibers in this region, are very numerous with thick walls, small cavity, and, in a majority of instances, a rectangular outline on transverse section. Small amounts of bark parenchyma and sieve tissue also occur between the rays.

In the powder of renewed bark, the most prominent elements are the fibers and the masses of secondary cork.

MEASUREMENTS OF FIBERS IN VARIETIES DISCUSSED.

	SMALL	AVERAGE	LARGE	RELATION OF LENGTH TO WIDTH
C. Calisaya	0.414 x 0.054 mm.	0.659 x 0.061 mm.	0.828 x 0.090 mm.	10-1
C. Ledgeriana	0.495 x 0.045 mm.	0.675 x 0.059 mm.	0.990 x 0.081 mm.	11-1
C. Succirubra	0.540 x 0.045 mm.	0.739 x 0.057 mm.	0.828 x 0.072 mm.	13-1
C. officinalis	0.250 x 0.025 mm.	0.399 x 0.038 mm.	0.575 x 0.050 mm.	10-1
Cuprea (Remijia) ..	0.160 x 0.015 mm.	0.267 x 0.018 mm.	0.423 x 0.020 mm.	15-1
Maracaibo	0.612 x 0.063 mm.	0.783 x 0.094 mm.	1.170 x 0.135 mm.	8-1

SUMMARY OF THE IMPORTANT CINCHONA BARKS ACCORDING TO HISTOLOGICAL CHARACTERISTICS.

(After Dr. A. Vogl.)

A. Barks with cork present.
  I. Bast fibers prominent—radially and tangentially arranged.
    a. Stone cells present in middle bark and outer portions of inner bark.
      Stone cells mostly in middle bark—laticiferous ducts absent.
        Wood cells (*stabzellen*) in bast region=*C. lancifolia.*
        Wood cells (*stabzellen*) none=*C. lucumaefolia.*
      Stone cells not prominent in middle bark.
        Bast bundles in very perfect isolated groups=*C. macrocaly.*
        Bast bundles toward the last not arranged in series=C. Palton.
    b. Stone cells absent or scattered in middle bark or outer portion of inner bark.
      Bast fibers very thick (90-250 mm.)—Laticiferous ducts wanting or at best very narrow.
        Wood cells present=*C. Pahudiana.*
        Wood cells absent=*C. pubescens.*
      Bast fibers moderately thick=*C. obtusifolia.*
      Bast fibers thin-laticiferous ducts wanting or narrow=*C. officinalis.*
  II. Bast fibers arranged in radial series or rows.
    a. Laticiferous ducts absent.
      Bast fibers thin or equally thick throughout the section—in interrupted radial rows=*C. Pitayensis.*
      Bast fibers unequally thick—the outer ones thinnest.
        Medullary rays of large cells—wood cells present.
          Middle bark without stone cells or with single stone cells=*C. cordifolia.*
          Middle bark with many stone cells=*C. Lancifolia.*
        Medullary rays of small cells—as a rule no wood cells=*C. lancifolia*
    b. Laticiferous ducts present.
      Middle bark containing numerous stone cells.
        Bast fibers thin or very thin,
          partly in interrupted rays—wood fibers present=*C. scrobiculata.*
          In interrupted rays—wood fibers absent=*C. ovata.*
        Bast fibers moderately thick—wide laticiferous ducts in middle bark—very many stone cells—wood cells in bast region=*C. peruviana.*
      Middle bark containing scattered stone cells or the latter absent.
      Narrow laticiferous ducts.
        Bast fibers moderately thick, the outer ones thinner.
          In regular zones—bast region soft=*C. officinalis.*
          Without regular zones=*C. heterophylla.*
        Bast fibers thick the outer ones thicker=*C. ticujensis.*

Wide laticiferous ducts.
Bast fibers very thin in interrupted radial series.
With "KOH," sections give blood-red reaction-bast fibers orange color=*C. succirubra.*
With "KOH," thin sections give yellow or reddish-brown reaction-fibers yellow=*C. cal.* or *ledger.*

B. Barks in which cork is absent.
a. Bast fibers in tangential bundles—moderately thick, bark very soft, brittle and fibrous=*C. lucumaefolia.*
b. Bast fibers expanding in outward direction—many in radial series thin or very thin—for the largest part in uninterrupted lines.
In double lines-cork still present—wide laticiferous ducts and numerous stone cells, fracture rough showing protruding ends of fibers=*C. scrobiculata.*
In single lines—stone cells wanting—short fracture=*C. australis.*
Moderately thick in interrupted single lines.
Bast fibers equally thickened—medullary rays extending directly outward—sharp fracture=*C. calisaya.*
Bast fibers not equally thickened.
Large celled medullary rays=*C. officinalis.*
Small celled medullary rays=*C. micrantha.*

Literature which may be consulted upon the subject of Cinchona.
"Historie Naturelle des Quinquinas," M. H. A. Weddell, 1849.
"Pharmacognosie," Dr. A. Vogl.
"Atlas zur Pharmacognosie," Dr. A. Vogl.
"The Cinchona Barks," Dr. E. A. Fluckiger, translation by F. B. Power.
"National Standard Dispensatory," 6th Ed., Hare, Caspari, Rusby.
"United States Dispensatory," 18th Ed., Wood, Remington, Sadtler.

Columbia University College of Pharmacy.

ASSAY OF HYDRASTIS AND FLUIDEXTRACT OF HYDRASTIS.

H. W. JONES.

The abstracts of proposed changes to be made in the forthcoming revision of the U. S. P. have been greeted with great interest and none perhaps more so than those dealing with the alkaloidal assays. (Jour. A. Ph. A., 1914-7, pp. 984-997.) Among the various assay processes of the U. S. P. (VIII), there was assuredly none more in need of revision than that of Fluidextract of Hydrastis, and the proposed change in the assay of this preparation will no doubt meet with general approval.

Puckner (Pharm. Rev., 1908, 26, pp. 132-137) called attention to the considerable error incident to the use of the eighth revision method, and pointed out the source of error, namely, the carrying down of hydrastine by the berberine hydriodide precipitate with the result that the 50 cc. aliquot part taken did not fully represent 5 cc. of the fluidextract, but gave too low a result. He proposed an excellent modification of the method, although apparently this modification has not met with general approval.

Eldred and Pence (Proc. A. Ph. A., 1908, pp. 836-838) also remarked on the low results obtained through the use of the eighth revision method, and also gave results obtained by a method used in their practice.

Dichgans, working under Prof. Tschirch, in a comparative examination of the assay processes of the different Pharmacopœias (*Apoth. Ztg.*, 29, 46, pp. 516-519),

has also discovered the fault in the method, and through comparison with the methods in use in other countries, has shown the low results obtained by its use.

While there is no doubt that most manufacturers have abided by the eighth revision method in standardizing Fluidextract of Hydrastis, it is evident that this has led to grave errors, for when this preparation was standardized to 2% hydrastine by the eighth revision method, the preparations were in fact some 15% to 20% above this figure. This also worked an injustice on the manufacturer who, instead of being able to obtain a full yield of fluidextract from a given amount of this high-priced drug, was able to gain only 80% to 85% of his possible yield.

The following results were obtained in this laboratory on different samples of Fluidextract Hydrastis and will suffice to bring out the points I wish to make. Preparations 1 and 2 were made in the laboratory strictly according to the U. S. P. (VIII) process for Fluidextract Hydrastis. Preparation 3 was also prepared in the laboratory but contained 20% glycerin instead of the official 10%. Preparation 4 was the product of a well-known manufacturer and was purchased in the open market.

Preparation	Drug assayed by U. S. P. VIII	Fluid extract by U. S. P. VIII	Fluid extract by U. S. P. IX
1	4.15	3.52	4.22
			4.2
2	3.12	2.56	3.14
3	3.83	2.61	3.21
			3.26
4	....	2.0	2.26

It will be observed that in preparations No. 1 and 2, the assay of the fluidextract by the ninth revision method is slightly higher than that of the drug from which it was made. In preparation No. 3, this peculiarity does not occur, and this is no doubt due to the fact that a 20% glycerin menstruum does not extract the drug as completely as does a 10% glycerin menstruum. In our opinion the apparently high results obtained by the ninth revision method are not incorrect, but the fault lies in the eighth revision method for the assay of Hydrastis, which unfortunately has been carried on into the ninth revision, that is, the amount of ether used in the maceration of the drug (150 cc. ether to 15 g. Hydrastis) is too small to prevent a crystallization of the hydrastin. This has been remarked upon by Dichgans (*Apoth. Ztg.*, 1914, 45 pp. 498-501) who shows that the results obtained by this method are lower than those obtained by the Swiss Pharmacopœia method, or by the method of Caesar & Loretz (*Jahres-Bericht von Caesar & Loretz*, 1913, pp. 155-156), in both of which methods 6 g. of drug are macerated with 120 g. (168 cc.) of ether, or more than two and one-half times as much ether in proportion as is used in the U. S. P. method. This might not be necessary for drugs low in hydrastin, but as an assay method should be applicable to all grades of the drug.

It might be remarked further, that the high results obtained by the ninth revision method for the fluidextract were at first attributed to the hydrastin being contaminated with glycerin. The hydrastin residues were, however, dried to constant weight and showed no appearance of glycerin. To be assured further, the combined ethereal extractions of the fluidextract were washed with several small portions of water in the hope of removing any glycerin which they might

contain, but the final results were practically identical with those first obtained.

The conclusions to be drawn are then, that the ninth revision method for the assay of Fluidextract of Hydrastis is satisfactory; and that the method for Hydrastis might well be reconsidered, and a larger proportion of ether used to extract the drug.

Laboratory of The Wm. S. Merrell Chemical Company, Cincinnati, Ohio.

WHAT IS THE BEST END-POINT OF THE REACTION IN THE FROG-HEART METHOD OF DIGITALIS ASSAY?

L. W. ROWE.

While there are various methods in use for standardizing the digitalis series of heart tonics, the frog-heart method devised and introduced by Houghton,[1] in 1894, has perhaps been most widely used in more or less modified form.

These modifications are specifically due to differences of opinion, as to the proper length of time, after dosing, to note the end-point of the reaction, namely, the characteristic systolic stand-still of the heart or the death of the animal with its heart in systole.

The original method made use of the minimal lethal dose, or smallest dose capable of causing the death with heart in systole, of a majority of the frogs to which a certain amount of the preparation in question had been administered. In a somewhat amplified form[2] the method was presented before this Society in 1909.

In 1902, Famulener & Lyons[3] described a method which has been in use in the University of Michigan Pharmacology Department for some time, according to Edmunds.[4] This consists, in brief, in administering such a dose of a digitalis heart-tonic to a frog, as to cause paralysis of the heart in systole in one hour. Edmund's modification differs only in having complete stoppage of the heart—not only systolic but auricular as well.

Barger and Shaw[5] used the same method of injection, namely, into the dorsal lymph-sac, but the frogs were kept under observation until the heart stopped, which they found was within three hours, if at all.

Fraenkel[6] practically limited the time to one hour, although a range from thirty-five to one hundred minutes is allowable, in his modification.

Ziegenbein[7] used the modification originated by Hans and Arthur Meyer of fastening male frogs to a board and exposing the heart before injection. The solution is injected into the thigh lymph-sac and in such a quantity as to produce systolic standstill in two hours.

Gottlieb[8] used as his unit "The smallest amount of the solution which will call forth systolic standstill of the heart of a 30 gm. frog in exactly thirty minutes."

Focke first published his modification of the frog-heart method in 1902.[9] This has been changed somewhat, but is essentially to determine the minimum dose causing systolic standstill in seven to fifteen minutes.

His method is more complicated than the others because of his taking into account the time period. The value of a sample is the result obtained by dividing

the frog weight by the product of the dose multiplied by the time. This makes the element of time a very important factor. Delayed absorption or exceptional resistance will lower the apparent value greatly.

While at this time, we are not considering suggested methods for standardizing the heart tonics of the digitalis series, other than by the use of frogs, it is not inappropriate to refer to the use of the warm-blooded animals. For example, Hatcher's Cat Method,[10] Reed and Vanderkleed's Guinea Pig Method,[11] Heinz' Mouse Method,[12] and the use of rabbits or dogs to determine the blood pressure and heart action, are all valuable. But for obtaining a fairly accurate estimation of the relative values of two preparations they do not appear to offer any material advantage over the frog-heart method first suggested and used for this purpose. Not only this, but cost, convenience and lack of general adaptability have prevented any extended application of them.

Edmunds & Hale [13] concluded that because in most cases the toxic action is not on the heart but on the respiratory centres "Methods which employ as a standard the minimum lethal dose obtained from the higher animals are not applicable to the physiological assay of the digitalis series."

The Frog-Heart Method may be considered to have three distinct modifications or that there are two modifications of the original twelve-hour method of Houghton, namely, the so-called Short-Time Method of Focke, and the One-Hour Method of Famulener & Lyons.

The Twelve-Hour Method of Houghton, is, distinctly, one allowing the total toxic effect of the drug to take place. The animal dies or recovers. A more or less total paralysis of the whole heart or of the ventricles may have taken place in many of the test animals, but unless this occurred and resulted in the death of a majority of five or more frogs following the injection of a certain quantity of the drug, a larger quantity must be chosen as the minimal dose. Delayed absorption, therefore, due to the nature of the drug will not vitiate the results: even digitalis has every opportunity to exert its characteristic effect.

During a large part of the year this takes place in three or four hours, or even less, in the case of Strophanthus, but during the winter months, and especially if the water in which they are kept is very cold the final result may be delayed considerably more than twelve hours.

If, however, we limit the time to one hour, or to ten minutes, and expect the drug to show its whole range of action, from therapeutic through to toxic, it is probably demanding the impossible of such a complex mixture as a fluidextract of digitalis. Absorption could not be complete in ten minutes and possibly not in one hour.

If the sample were a pure principle to be tested in comparison with a standard of like properties, the results should be comparable, otherwise the uncertainties of a physiological assay are considerably increased. Edmunds & Hale[13] conclude "that between these two methods (the twelve-hour and one-hour) it is largely a question of personal preference or convenience as far as can be judged in the light of our present knowledge."

Focke's Short-Time Method gives such inaccurate results, is so complicated, and is open to such extreme variations, that no results, by this method, are included.

The following series of tests has been carried out to compare more directly the advantages of two of the frog-heart methods of digitalis assay previously mentioned. The minimum dose of each preparation was determined according to both methods under as nearly similar conditions as possible. By personal observation as to the definiteness of the end-point, we were able to form an opinion regarding the value of each method as a means of determining the activity of preparations of the digitalis series:

TABLE No. I

FLUID EXTRACT DIGITALIS.

Description		M/L. D. 12-Hr. Method	Ratio, dose by 12-Hr. Meth. to 1-Hr. Method	Dose 1-Hr. Method
	1	.0010	(1.42)	.0007
	2	.0011	(1.37)	.0008
	3	.0017	(1.13)	.0015
	4	.0014	(1.55)	.0009
	5	.0016	(1.07)	.0015
	6	.0008	(1.14)	.0007
	7	.0008	(1)	.0008
	8	.0010	(1)	.0010
	9	.0008	(1)	.0008
	10	.0007	(1)	.0007
	11	.0009	(1.12)	.0008
	12	.0020	(1.81)	.0011
	13	.0013	(1.3)	.0010
	14	.0009	(1.29)	.0007
		Average	(1.22)	

TABLE No. II

TINCTURE DIGITALIS.

		M. L. D. per gm. 12-Hr. Method	Ratio of Doses	1-Hr. Method Dose
U. S. P.	1	.014	(1.27)	.011
B. P.	2	.009 (.010)+)	(1.5)	.006 (.007—)
		Figured to U. S. P. Strength		
B. P.	3	.010 (.011)+)	(1.43)	.007 (008.)
U. S. P.	4	.011	(1.27)	.008
U. S. P.	5	.016	(1.23)	.013
U. S. P.	6	.012	(1.5)	.008
U. S. P.	7	.009	(1.28)	.007
U. S. P.	8	.009	(1.5)	.006
U. S. P.	9	.008	(1.6)	.005
U. S. P.	10	.016	(1.33)	.012
U. S. P.	11	.014	(1.4)	.010
U. S. P.	12	.006	(1.2)	.005
		Average	(1.36)	

TABLE No. III.

POWDERED EXTRACT.

1	.00024	(1.09)	.00022
2	.00014	(1.4)	.00010
3	.00030	(1.2)	.00030
4	.00025	(1.25)	.00020
	Average	(1.20)	

SOLID EXTRACT. ..

1	.00014	(1.27)	.00011
2	.00018	(1.28)	.00014
3	.00036	(1.28)	.00028
4	.00036	(1.20)	.00030
5	.00022	(1.22)	.00018
	Average	(1.24)	

DIGITALONE AND DIGITALIN.

1	.028	(1.33)	.021
2	.013	(1.41)	.008
3	.00009	(1)	.00009
4	.00004	(1)	.00004

TABLE No. IV.

STROPHANTHUS.

	M. L. D. 12-Hr. Meth.	Ratio of dose by 12-Hr. Meth. to 1-Hr. Method	1-Hr. Method
1	.00005	(.83)	.00006
2	.00004	(.80)	.00005
3	.00006	(.75)	.00008
4	.000045	(.32)	.00014
5	.00012	(.54)	.00022
6	.00011	(.64)	.00017
7	.00009	(.45)	.00020
8	.00007	(.43)	.00016
9	.00011	(.68)	.00016
10	.000075	(.53)	.00014
	Average	(.543)	

TABLE No. V.

SQUILL.

1	.0006	(.75)	.00008
2	.0007	(.87)	.0008
	Average	(.81)	

TABLE No. VI.

CONVALLARIA.

1	.00016	(1.23)	.00013
2	.00024	(1.09)	.00022
3	.00010	(.91)	.00011
	Average	(1.08)	

The fact which stands out most prominently from a superficial examination of this date is that the minimum dose of digitalis preparations is in most cases less by the one-hour method than it is by the twelve-hour method. The opposite is true in the case of Strophanthus preparations. This seems more logical since one would naturally expect it to require more of the active substance to cause systolic stoppage of the heart in one hour than to cause the death of the frog. Digitalis in sub-lethal doses must, therefore, produce an early paralysis of the heart from which the frog recovers. This fact in itself would seem to point to a possible cause for discrepancies in the one-hour method.

It is only with samples of Tincture Digitalis that we are able to obtain a clearly defined and uniform end-point by the one-hour method. In most of the tests of other members of the digitalis series the end-point is either difficult to determine because of inability to check the minimal dose or the heart does not stop in definite systole. It would seem that there should be some very nearly constant ratio between the minimum dose obtained by each method with the same preparation, but as stated above this has not been found true except approximately in the case of Tincture Digitalis.

Our observations would lead to the conclusion that the variability in the individual resistance of the frogs to digitalis plays a more important part in the one-hour method of assay than it does in the twelve-hour method and consequently adds to the indefiniteness and inaccuracy of results by the latter method. The

time element also has an important bearing on the comparative results by the two methods. Where the time which elapses between the injection of the active material and the observation of the result is relatively short the effect of the same dose of the same preparation (and by the same does we mean in proportion to weight) upon frogs of different resistance may be sufficient to produce conflicting results. On the other hand in a method involving longer period of observation where the death of the animal rather than a paralysis of the heart is the final end-point this difference of resistance does not play so important a part. It is true that even in the twelve-hour method the variation in the resistance of the test animals is an important factor, but it can be more easily and completely eliminated by this method than could be done in the case in the one-hour method, even if a similar procedure were applied, i. e., elimination of the factor of resistance variation by the use of a large number of test animals, and of a standard for comparison.

The point that we wish to emphasize, however, is that while variation in resistance can apparently be offset in both methods by the carrying along of a standard preparation of known strength, yet there seems to be varying degrees of paralysis of the heart; and that this paralysis has no uniform relationship to the death of the test animal. In the data on F. E. Digitalis in some cases, the minimum dose was the same by both methods, but the average lethal dose exceeded the one-hour dose by 22%, with a maximum variation of 81%. In the case of the Tincture Digitalis the variation ranges from 10% to 60%, the average excess required to kill the frogs over that necessary to cause systolic stand-still being 33%. Comparison of Strophanthus tinctures by the two methods shows that 54% of the one-hour dose will kill the frog, Squill 80%, Convallaria 108%.

From our observations we, therefore, summarize as follows: First, that the end-point in the one-hour method is more indefinite and consequently more difficult to determine than that of the twelve-hour method; second, that the variation in resistance of the test animal is a source of much greater error in the accuracy of the shorter method than it is in the other; third, that an absolute end-point such as death is more satisfactory than one which may show so many degrees of variability.

Our conclusion is that the death of the frog with heart in systole is a more accurate and dependable end-point in the reaction than a similar stoppage of the heart observed at any time previous to the absolute death of the animal.

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Contributed and Selected

THE ARMY HOSPITAL CORPS.

WM. B. DAY, PH. G.

Surgeon General Gorgas, in his annual report to the Secretary of War, recently published, earnestly urges an improvement in the conditions of the Army Hospital Corps. He again calls attention to the difficulty in securing desirable men for this important corps, and points out the fact that other branches of the service offer superior inducements. Dr. Gorgas refers to bills that have been introduced in Congress looking to the improvement of the efficiency of the Hospital Corps and which were drafted in accord with the recommendations of his office,—evidently meaning the Hughes-Bacon bills. But these "have not received the approval of the War Department." And this is the gist of the difficulty which our committee met with in urging the passage of these bills—their failure to secure the approval of the War Department,—which blocked our efforts completely. We were informed that the War Department had under consideration remedial legislation for the Hospital Corps. Secretary Garrison informed President Beringer that "should conditions in the Hospital Corps ever become so unsatisfactory, and such as to indicate that an improvement can be brought about only by an increase in pay of the members, the necessary increase will be recommended." Judging from the following paragraphs, quoted from the Surgeon-General's report, this time has arrived:—

"Attention has been repeatedly called to the deficiency in the number of Hospital Corps authorized for service, and recommendation made for an increase. On April 29, 1914, the Secretary of War authorized an addition of 1,500 men, making a total of 5,012 for the corps. May 9, 1914, authority was granted for the appointment of sixty additional sergeants. To date, 543 men in excess of the number previously allowed (3,512), have been re-enlisted in, enlisted for, or transferred from the line, to the Hospital Corps. The greater number of these men were used in the organization of new mobile units and field vacancies in the Second Division and with organizations on duty on the Mexican border.

"The class of men secured for the Hospital Corps, have by no means been satisfactory. During the excitement attending a possibility of active service in a campaign beyond the limits of the United States, a greater proportion of desirable men presented themselves for enlistment, and the commanding officer of one of the new organizations reported that he was receiving better men than had been serving with the detachment at his post. With passage of the incentive, the quality again deteriorated. A commanding officer of a post in commenting on his detachment expressed himself as follows: 'The sergeant is efficient and energetic, but the Hospital Corps men, with the exception of the sergeant, are

the riff-raff of the Army—and I am not putting it too strongly. In two or three cases they are not only woefully inefficient but are not clean personally. I have directed the surgeon to make a special report in the case and will give him any help he needs from our own troops. I really think that these men were transferred to rid some other command of worthless men, an almost criminal procedure when one considers how badly good Hospital Corps men are needed.'

"In each annual report of the Surgeon General for the past two or three years, attention has been invited to the inferior character of a considerable proportion of the men who are accepted for the Hospital Corps. And the reason for this has been pointed out, viz., the inferior inducements offered by the Hospital Corps in comparison with the opportunities offered by other branches of the service. Bills have been introduced in Congress for improvement in this respect along the lines recommended by this office, but these have not received the approval of the War Department. It is earnestly recommended either that this disapproval be reconsidered or else that other inducements be made by means of special ratings or in any other way whereby service in the Hospital Corps can be made sufficiently attractive to secure a desirable class of men."

The Surgeon General presents the bright as well as the dark side of the picture, as shown by the following instances of heroism displayed by members of what is sometimes termed a "non-combatant branch" of the Army:—

"Fortunately, however, all the men secured, even under the present unfavorable condition, are not undesirable men and a number of individual cases have occurred during the year where enlisted men of the Hospital Corps have rendered efficient and distinguished service. In October, 1913, a train carrying a band and two companies of Coast Artillery Corps, left the track and crashed through a wooden bridge near Buckatunna, Miss., and as a result, seventeen men were killed and nearly one hundred more or less seriously injured. Sergt. Halbert M. Beasley, Hospital Corps, although he was himself injured, worked unceasingly in rendering first aid and assisting in the removal of the wounded. For this he was awarded a certificate of merit. On March 25, 1914, Pvt. First Class Thomas Mosely, Hospital Corps, was awarded a certificate of merit for distinguished gallantry in action against hostile Moros while private, Hospital Corps, when he bandaged a wounded officer, in the face of a heavy fire from the Moro trenches, and carried him to a place of safety at the risk of his own life. This at Bagsak Mountain, Jolo, P. I., June 11, 1913."

"On April 21, 1914, Pvt. First Class Edward W. Morrison, Hospital Corps, was awarded a certificate of merit for meritorious conduct in rendering first aid to wounded comrades under fire of hostile Moros at Mamaya Peak, P. I., December 15, 1913."

As showing the need for medical knowledge and skill of no mean order and as an instance of the heavy responsibilities assumed by the military pharmacists is the following:—

"On March 6, 1914, a private of the Signal Corps detachment at Nulato, Alaska, presented evidence of an appendiceal abscess. No medical officer was present with this small detachment, but Sergt. First Class Richard A. Wood, Hospital Corps, diagnosed the case and communicated by telegraph with the surgeon at Fort Gibbon, about 250 miles distant. The surgeon started, but the distance had to be traveled by dog team and at least four days would be required for the trip. Two days later Sergt. Wood communicated with the surgeon by telegraph and stated the urgency of the symptoms and the condition of the patient. The condition of the soldier was so urgent as to demand immediate

operative interference and Sergt. Wood was authorized to proceed. On the same day the sergeant opened and drained the abscess under a local anesthesia. When the surgeon arrived the patient was in good condition. The surgeon reports that in his belief Sergt. Wood, by performing a prompt drainage of the abscess, greatly facilitated the patient's recovery and probably saved his life."

The authorized strength of the Hospital Corps is as follows:—

Sergeants, first class	300
Sergeants	422
Corporals	50
Privates, first class, and privates	4,240
Total	5,012

There were in the service June 30, 1914:—

Sergeants, first class	300
Sergeants	399
Corporals	41
Acting Cooks	180
Privates, first class, and privates	3,135
Total	4,055

The new committee on Status of Pharmacists in the Government Service, to be appointed by President Mayo, should lose no time in getting in touch with the War Department with a view to learning at the outset whether the Department will approve of a bill drafted along the lines of the Hughes-Bacon Bill—and if such approval is withheld then a strong effort should be put forth to discover what the objections of the Department really are and how they may be overcome. It is futile to enter upon another campaign at the coming session of Congress until these facts are determined.

A SYMPOSIUM ON THE PHARMACEUTICAL SYLLABUS.

(Continued from last month.)

BOSTON, MASS.

The Pharmaceutical Syllabus was first considered at a meeting held at Niagara Falls in June, 1906, and plans for its preparation were worked out by a Committee consisting of Willis G. Gregory of Buffalo, Henry H. Rusby of New York City, and Henry L. Taylor of Albany. This Committee soon decided to give the proposed publication a national character, by inviting the National Association of Boards of Pharmacy and the American Conference of Pharmaceutical Faculties each to appoint representatives on the Committee. This invitation was formally accepted by each of the organizations in September, 1906, and the membership was thus increased to five members, who soon afterward appointed sixteen other members from boards of pharmacy and faculties of colleges of pharmacy. The number of members has been twenty-one since 1906, with but few temporary vacancies. In 1910, after the issue of the first edition, the American Pharmaceutical Association adopted a by-law providing for representation on the Committee and the method of appointment of members was changed so that each of the three organizations represented appoint seven of the twenty-one members on the Committee. Since its organization, the Committee has included representatives from many of the leading colleges of pharmacy in the United States and from many of the state boards of pharmacy.

The expenses of the Committee have been paid from annual appropriations of twenty-five dollars from each of the three parent organizations and from the receipts from the sale of the second edition. No member of the Committee has been paid anything for his work, which has been very considerable in several cases.

The need of an outline of the standard course in pharmacy is generally conceded and it was strikingly shown, when the Committee began an inquiry into the courses given by colleges of pharmacy throughout the country, by the differences in subject-matter, length of courses and methods of teaching that were reported. Members of the Committee had great

differences of opinion on what constituted a proper course in pharmacy and many stormy times have resulted from these and other causes.

Dr. Henry L. Taylor, of Albany, N. Y., an official of the New York State Education Department, was secretary-treasurer of the Committee from 1906-1914, and has done more than any other one man for the Syllabus. Dr. Taylor is an educator and not a pharmacist, and his point of view was often very different from that of other members of the Committee. He is a man of tireless energy with the courage of his convictions and he was often at odds with various members. We believe that in the future the great amount of unselfish work done by Dr. Taylor will be appreciated at its true worth. On the issuance of the second edition, Dr. Taylor withdrew from the office of secretary-treasurer, in accordance with notice previously given, and the writer was elected to the office.

The recent agitation against the Syllabus came almost entirely from certain members of the Committee, apparently because they could not induce the Committee to adopt some of their ideas and they were unwilling to accept a compromise. We believe that these gentlemen are sincere in their efforts, but we could not agree to all of their propositions and thus we antagonize them.

No member of the Committee believes that the Syllabus is near to perfection. The first edition was very imperfect in many parts. In the second edition these faults are largely corrected, or replaced by new matter, and this edition is a great improvement over the first. This is the only way in which such a book can be prepared and if succeeding editions each show improvement over the immediately preceding one we shall ultimately have as nearly perfect a work as can be obtained. With this in view, the Committee is planning for revision every five years. The proposal, which has been made and rejected, that all of the good in the present syllabus be thrown away and a new one prepared, was not a good one. What we need is constructive, not destructive criticism.

THEODORE J. BRADLEY.

NEW ORLEANS, LA.

The object of the Syllabus, is uniformity in teaching the various branches of pharmacy and as a guide to both the teachers of schools of pharmacy and the examiners of boards of pharmacy. It must be admitted that graduates of pharmacy are examined by other boards than the one of the school, it is rather the exception than the rule.

If there is no unanimity of action between colleges and boards of pharmacy of the same state, the object of the syllabus is defeated.

Personally, the Syllabus appeals strongly to me and while there is, as has been too often admitted, gross errors in the old issue, it can be made to serve a most excellent purpose in the pharmaceutical education of this country, but, not only is its adoption by every college and board of pharmacy necessary, to carry out the objects of those credited with its introduction, but the boards and colleges of the same state must work along the same lines.

The fact that this work is the result of the combined efforts of members composing every avenue of pharmaceutical endeavor, is in itself an indication of the kind of pharmaceutical thought that it reflects. Composed of committee of seven each, from the American Pharmaceutical Association, the National Associations of Boards of Pharmacy and the American Conference of Pharmaceutical Faculties, it does not seem possible that such a Committee could have issued something wholly at variance with the pharmaceutical educational needs of this country.

The work of the Syllabus Committee proper could be materially strengthened by the appointment of sub-committees of five members each, from the same associations from which the Syllabus Committee was derived, to correct and eliminate any of the short-comings in the publication that may exist. This would not be any additional expense to the Syllabus Committee, as these members could be selected from the membership of the three bodies who regularly attend the annual meeting of the American Pharmaceutical Association.

PHILIP ASHER, M. D., DEAN.

BALTIMORE, MARYLAND.

Sir:—I am somewhat embarrassed by your request for an expression of my views upon the second issue of the Pharmaceutical Syllabus, since I feel incompetent to discuss a subject which has had such long and careful study and such close attention from an unusually able committee; on no account, would I discuss any part of the Syllabus, excepting that which refers to the branches which I am trying to teach.

Much pleasure and encouragement have followed an examination of the last edition; the changes made bring it more nearly in accord with my ideas regarding the teaching of dispensing and commercial pharmacy. I have, lately, gone over the outline given for these branches and am pleased to note that, during the last twelve years, our efforts have been in close accord with the suggestions of the Syllabus committee. As an instance of the help I derive, I will state, that, for several years I have been wondering if I should continue to instruct students how to spread plasters. I find that the Syllabus recommends that such instruction be given, consequently, I am justified in continuing the practice.

The separation of pharmaceutical jurisprudence from the commercial course is, in my

opinion, entirely proper, and another instance of progress, as this was not so in the former edition of the Syllabus.

In regard to the time devoted to the different branches, I notice that seventy-five hours is suggested for commercial pharmacy. We have given but forty-eight hours to this branch and have found it quite enough to equip the better students for the commercial part of pharmacy. If I could be decided in any criticism of the dispensing course, I would say that the time allotted to this important work is entirely too little. We find that a hundred and ninety-two hours in the two years is none too much to give students the knowledge and practice necessary to equip them for prescription work.

On the whole, I am one of those "simple-minded fellows" who believe that the Syllabus Committee has done wonderfully well with a most difficult problem, and if the members of the Committee continue their good and helpful work, the Syllabus will soon be of great assistance to pharmaceutical schools and teachers and a credit to all concerned.

HENRY P. HYNSON.

BROOKLYN, N. Y.

With much interest did the writer follow the discussions on the Pharmaceutical Syllabus at the A. Ph. A. Convention at Detroit, and also the minutes as published in the November number of the Journal.

The chief object of the Pharmaceutical Syllabus is to indicate the general scope and character of the instruction to be given by the teacher, and to outline the work to be done by the pharmaceutical student. It is an everlasting credit to the A. Ph. A. to have originated this splendid idea, which has resulted in a work which represents not only the A. Ph. A., but also the American Conference of Pharmaceutical Faculties, as well as the National Association of Boards of Pharmacy.

The National Syllabus Committee, thus formed, has so far published two editions of the National Syllabus. As was to be expected, the first edition of this book did *not* prove very satisfactory. However, pharmacists at large and quite especially the pharmaceutical educators in the United States had reason to expect that the second edition of the Pharmaceutical Syllabus would be a decided improvement. But to the great surprise of all of those looking for an *improved* edition, a sad disappointment resulted.

The writer has always taken an active interest in pharmaceutical education, and still more so since his appointment as Professor of Pharmacy, Pharmaceutical Chemistry, and History of Pharmacy in the Department of Pharmacy in the College of Jersey City. That the second edition of the Pharmaceutical Syllabus did *not* prove satisfactory to the Faculty of our College, can be seen from the following comments which have been published in our catalogue for the Session 1914 to 1915.

OUR ATTITUDE TOWARD THE PHARMACEUTICAL SYLLABUS.

The aim of the Pharmaceutical Syllabus is to outline a minimum course of study which would be broad enough and sufficiently well balanced to be acceptable as a basis of instruction to our schools of pharmacy and at the same time would be sufficiently extensive to be of use to our boards of pharmacy, to examine candidates for state conferred rights and privileges.

The Second Edition has been compiled by the National Committee of the Pharmaceutical Syllabus and published in June, 1914. Our College immediately appropriated a copy for each department. After careful consideration our faculty found itself heartily in sympathy with the objects of the Pharmaceutical Syllabus and considers the present, Second Edition a material improvement on its predecessor. However, our College is unable to *adopt* the Pharmaceutical Syllabus in its present status, in its entirety and for the following reasons:—

1.—Because no lectures are provided on the Theory of Pharmacy for the Senior year, which in our experience is a serious deficiency.

2.—Because the Syllabus for the subject of pharmacy provides during the Junior year only a total of 195 hours and for the Senior 205 hours. This time is entirely inadequate for a thorough course in this important branch of the work in order to provide the student with sufficient knowledge to take charge of a pharmacy in which drugs are dispensed and prescriptions compounded and also to pass the state board examination in a competent manner.

3.—Because as many as seventy-five hours are provided for Commercial Pharmacy and only sixty for Dispensing Pharmacy during the Senior term. This allotment of time is in the opinion of the Faculty unjust, as it lays too much stress upon commercialism and too little upon the professional side.

Nevertheless, in the arrangement of our courses, the Syllabus has been followed as much as possible and as far as in the opinion of our Faculty it was justified by experience and in accordance with our principles.

To the above comments, the writer may add the following personal ones:—

1.—In carefully looking over the second edition of the Pharmaceutical Syllabus, I find that only thirty-five pages are devoted to Pharmacy, while on the other hand, Materia Medica

occupies fully fifty-six pages. Let me ask the pharmaceutical educators and pharmacists in general if this is *fair* to the student at a school of pharmacy?

2.—Physiology occupies eleven pages and Dispensing Pharmacy only three pages! Just think of it!

3.—Posology, a Junior Study of but fifteen hours, occupies thirteen pages! Evidently, the gentleman who prepared this *outline* most certainly did *stretch* same!

4.—Last, but not least, Chapter VI, Reference Works, and Chapter VII, Text-books and Pharmaceutical Periodicals, both of which chapters occupy such a prominent place in the second edition of the Pharmaceutical Syllabus, are so full of mistakes, grammatical and otherwise, that they are certainly a disgrace to American Pharmacy. This latter fact has been so fully commented upon at the Detroit Convention, that it is unnecessary for the writer to dwell upon it any longer.

CONCLUSION.

In conclusion, I beg to state that the aim of the Pharmaceutical Syllabus is most certainly a laudable one. Let us hope that the third edition will be a great improvement upon its predecessors, and that it will prove satisfactory to our schools of pharmacy, and also to our boards of pharmacy. Up to the present time, there has been quite some confusion between the fact that the Pharmaceutical Syllabus is *sometimes adopted*, but *most generally only approved!*

Let us hope that the next edition of the Pharmaceutical Syllabus will be a master-work, which will be *adopted* by *all* the colleges of pharmacy and *all* the boards of pharmacy!

OTTO RAUBENHEIMER.

DERIVATIVES OF SALICYLIC ACID.

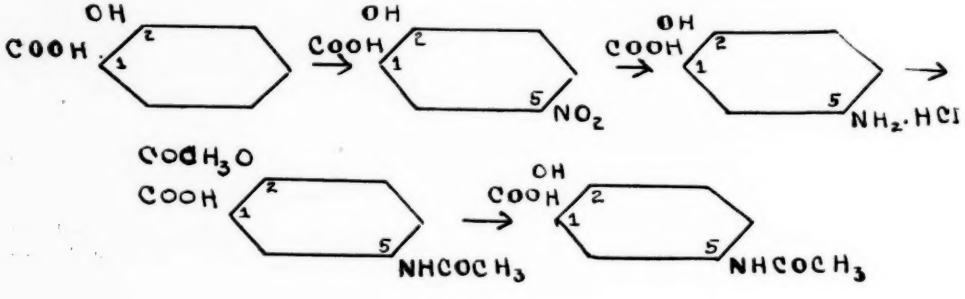
JOHN W. FORBING, PH. C., B. S.

ACETYLAMINO-SALICYLIC ACID AND ACETYLAMINOACETYL-SALICYLIC ACID FROM SALICYLIC ACID.

The following paper presents detailed methods for the production of the various acids which compose the steps of the synthesis. Interest is attached specially to acetylamino-salicylic acid $C_6 H_3 (NHCOCH_3) OHCOOH$, in that its structural formula bears a resemblance to what might be termed, a composite of the active radicles of Phenacetin, $C_6 H_4 O. C_2 H_5. NHCOCH_3$, and Aspirin $C_6 H_4 COOH.OCOCH_3$.

Acetylamino-salicylic acid forms soluble salts with, NH_4, K, Na, Ca, and Sr. If tests indicate clinical usefulness, the product would have a decided advantage over the various insoluble varieties of Analgesics and Antipyretics.

The process of synthesis is based on the nitration of salicylic acid, the production and isolation of assymetric metanitro-salicylic acid (1-2-5) with liberal yield; the conversion of the nitro-salicylic into amino-salicylic acid hydrochloride and subsequent acetylation of the Amino and hydroxyl groups:—



Pharmacological, bactericidal and clinical factors are at present being determined by the Creighton College of Medicine and will be reported in the near future.

Assymetric metanitro-salicylic acid (1-2-5) is obtained by the following process:— 160 gm. potassium nitrate is placed in a 2000 cc. flask with 200 gm. sodium salicylate, and a solution of the salts is made with 600 cc. of water; 250 cc. of concentrated sulphuric acid is gradually and cautiously added, controlling the re-action by the affusion of cold water. After complete addition of sulphuric acid, the contents of the flask are poured into a spacious, porcelain evaporating-dish and 20 cc. of fuming nitric acid added, and the mixture allowed to stand for two hours. It is then heated on the water-bath for about one hour, in order to complete re-action, and allowed to stand in a cool place for twelve hours. The crystalline mass which separates out, is removed by means of a Buechner funnel and vacuum pump, and pressed free from mother-liquor. The mass is then dissolved, by boiling it in a solution of 130 gm. of sodium hydroxide in 750 cc. of water. The resultant dark-red solution is allowed to cool. There separates a reddish-brown mass composed principally of di-sodium-metanitro-salicylate, $C_6 H_3 (NO_2) O Na COO Na.5H_2O$. The mass is placed in a funnel, exhausted by vacuum and pressed. (The filtrate may be reserved, and vicinal nitro-salicylic acid, with a m. p. 118°, may be obtained by acidifying with HCl, boiling with purified animal charcoal, filtering hot, removing the cream-yellow crystalline mass which separates out on cooling, and purifying by conversion, into the K-salt. The K-salt is very soluble in boiling aqueous solution and, on cooling, crystallizes out in long, yellow, silky needles.)

The di-sodium-metanitro-salicylate mass is purified by solution in 500 cc. of boiling water, removal from source of heat and adding 200 cc. of methyl alcohol. On cooling, a bright uniformly-colored orange-red mass, crystallizes out, which is practically pure di-sodium-metanitro-salicylate.

Analysis of the mass washed with methyl alcohol, dried in air:—

Calculated for $C_6H_3(NO_2)ONaCOONa.5H_2O$.

0.5597 gm. substance—0.1589 gm. H_2O calculated—0.1508 gm. found.

0.2021 gm. substance—0.0677 gm. Na_2CO_3 calculated—0.0708 gm. found.

The mass of di-sodium-nitro-salicylate yields the acid by placing it in 500 cc. of water, acidifying with HCl with an excess of about 150 cc., boiling and filtering while still hot. The acid is practically insoluble, in boiling water containing HCl, and remains on the filter as a yellow mass. This mass is washed with water and pressed, dissolved in boiling alcohol to which is added purified animal charcoal and filtered hot. The filtrate may be evaporated on a water-bath with a yield of 72 gm. of assymetric metanitro-salicylic acid in yellow prism crystals. Melting point, 228° with charring, (agreeing with data given in Richter's Organic Chemistry, Smith, vol. 11, p. 225).

Analysis for Nitrogen:—KJELDAHL-GUNNING METHOD:—

Calculated—N, 7.66%; found—N, 7.40%.

DUMAS' METHOD, *Technic*, Weyl (*"Die Methoden der organischen Chemie, Allgemeiner Teil, s.* 34").

Calculated—N, 7.66%; found—N, 8.16%.

With potassium bicarbonate, the acid yields a salt crystallizing from hot aqueous solution in saffron-yellow needles; this salt dried two weeks *in vacuo* over H_2SO_4 gave the following, potassium as K_2SO_4:—

0.45.. g. Salt; K_2SO_4; Calculated—0.1802. Found—0.1784.

The nitro-salicylic acid obtained by the above process is converted into amino-salicylic acid by reduction with tin and HCl.

50 gm. nitro-salicylic acid crystals is placed in a flask with 250 cc. of alcohol, 100 gm. tin and 200 cc. HCl added. The acid is added in portions of 50 cc. and the heat of reaction controlled by affusion of cold water. After addition of acid, an hour, is allowed for complete reaction:—

$$C_6H_3(NO_2)OHCOOH+3\,Sn+6\,HCl=$$
$$C_6H_3(NH_2)OHCOOH+2\,H_2O+3\,SnCl_2.$$

The contents of the flask are then heated until the white precipitate which is formed, is re-dissolved, and filtered hot. The alcoholic filtrate is evaporated, on the water-bath, to about two-thirds of its volume and allowed to stand for twelve hours. At the end of this time a large proportion of the double salt of the hydrochloride of the amino-acid and $SnCl_2$ crystallizes out. The crystalline precipitate is separated and placed in 300 cc. of water and the tin separated with H_2S, filtered, and the filtrate evaporated on the water-bath. The amino-salicylic acid hydrochloride, $C_6H_3NH_2OHCOOH.HCl$, crystallizes out in shining grayish-white crystals. By this process a portion of the amino-salicylic acid hydrochloride, remains in the filtrate and may be obtained by additional precipitation of tin with H_2S as SnS and SnS_2. The solution is filtered cold, to avoid re-solution of SnS_2, and the residue of sulphides containing a portion of the sparingly soluble amino-salicylic hydrochlorides, may be heated with water and filtered hot, the filtrate giving an increased yield of the hydrochloride.

Acetyaminoacetyl-salicylic acid is prepared as follows: 20 gm. amino-salicylic acid hydrochloride, is placed in a 100 cc. round-bottom flask and an excess of acetic anhydride added. The flask is connected with an upright condenser and heated on an oil-bath to 140°-145° for one hour. The following re-action takes place:

$$C_6H_3(NH_2)OHCOOH.HCl+(CH_3CO)_2O=$$
$$C_6H_3NHCOCH_3.O.COCH_3COOH+HCl+H_2O.$$

HCl is liberated and acetylation takes place with the gradual formation of a clear solution. The product of the re-action is poured into 150 cc. of water, and the greater amount of the acetic acid formed, due to excess of the anhydride used, is driven off by boiling and the water replaced. On cooling, clusters of white crystals of acetylaminoacetyl-salicylic acid separate and are collected on filter and washed with cold water.

These crystals were purified for analysis by re-crystallization from alcohol.

Calculated for $C_6H_3NHCOCH_3O.COCH_3COOH$—N, 5.97%.

Found, 5.94, 6.07%.

This acid (acetylaminoacetyl-salicylic) has a melting point of 181°.

I found it impossible to produce a potassium salt of this acid. This acid gives no hydroxyl re-action with ferric chloride. On combining molecular weights of the acid and $KHCO_3$ the hydroxyl is opened and acetic acid liberated and the K-salt of acetylamino-salicylic acid is formed. If this re-action takes place in the presence of ethyl alcohol, ethyl acetate is formed. The following equations account for action taking place:

$$C_6H_3(CH_3CONH)O.COCH_3.COOH+KHCO_3=C_6H_3(CH_3CONH).OHCOOK+CH_3COOH+CO_2.$$

$$C_6H_3(CH_3CONH)O.COCH_3COOH+KHCO_3+C_2H_5OH=C_6H_3(CH_3CONH)OHCOOK+COCH_3.O.C_2H_5+CO_2+H_2O.$$

Both acetylamino-salicylic acid and its potassium salt give a rich blue-coloration with ferric chloride.

If acetylaminoacetyl-salicylic acid is neutralized with potassium carbonate the K-salt of acetylamino-salicylic acid separates from a hot aqueous solution as a fine white powder. The K-salt, free from H_2O, gave the following results on analysis, determining potassium as K_2SO_4 and assuming the formula to be $C_6H_3(NHCH_3CO)OH.COOK$:—

0.5621 gm. K-salt; K_2SO_4; found—0.2163. Calculated—0.2098.
0.0143 gm. K-salt; K_2SO_4; found—0.0407. Calculated—0.0427.

If sodium acetate be added to acetylaminoacetyl-salicylic acid as a condensing agent, in order to introduce, by means of acetic anhydride, an acetyl radicle in the carboxyl group, there results a compound, crystallizing from water acidulated with HCl in silver-lustred laminæ. This compound is undoubtedly the acetester of acetylaminoacetyl-salicylic acid; m. p. 245°. It is unstable and shortly after preparation gives acid re-action with potassium carbonate and a wine-coloration with ferric chloride. It crystallizes from alcohol in colorless prisms.

Creighton University Laboratories, Omaha, Neb.

TRANSATLANTIC TELEPHONY.

Mr. Marconi announces that an attempt to talk by wireless telephone from Carnarvon, Wales, to New York probably will be made within the next three months. Godfrey Isaacs, manager of the Marconi Company, testifying before the Dominion's Royal Commission on Imperial Communications, had said this feat probably would be accomplished before the end of the year, and he added: "I do not hesitate to express the opinion that if Marconi is able to telephone to New York he will, when the stations for wireless communication between this country and Buenos Aires are built, telephone to that city at the same time that he telegraphs."

Sir Rider Haggard, who is a member of the commission, anxious to follow up this peep into the future, asked Mr. Isaacs:

"You expect the time when a subscriber can have a telephone in his house by which he can telephone all over the world?"

Mr. Isaacs answered that he would not like to go so far as that. Many difficulties first would have to be overcome. It might be possible to go to a particular station in London and telephone to New York. There were great things yet to be revealed in the wireless business."—*Boston Transcript.*

Of General Interest

NATIONAL DRUG TRADES CONFERENCE.

PROCEEDINGS OF ANNUAL MEETING HELD AT THE NEW WILLARD HOTEL, WASHINGTON, D. C., DECEMBER 10, 1914.

President Wallace called the meeting to order at 10:30 a. m.

The Secretary called the roll of delegates duly accredited from their respective organizations.

American Pharmaceutical Association:
John C. Wallace, New Castle, Pa.
Samuel L. Hilton, Washington, D. C.
J. H. Beal, Urbana, Ill.

National Wholesale Druggists' Association:
Charles A. West, Boston, Mass. (absent).
C. Mahlon Kline, Philadelphia, Pa.
George W. Lattimer, Columbus, Ohio, represented by F. E. Holliday.

National Association of Retail Druggists:
Samuel C. Henry, Philadelphia, Pa.
J. H. Rehfuss, Brooklyn, N. Y.
J. F. Finneran, Boston, Mass. (absent).

American Association of Pharmaceutical Chemists:
Willard P. Stearns, Chicago, Ill., represented by George C. Hall, Brooklyn, N. Y.
Dr. W. C. Abbott, Chicago, Ill., represented by Dr. Alfred S. Burdick, Chicago, Ill.
R. C. Stofer, Norwich, N. Y.

National Association of Manufacturers of Medicinal Products:
Adolph G. Rosengarten, Philadelphia, Pa.
Dr. A. R. L. Dohme, Baltimore, Md.
Charles M. Woodruff, Detroit, Mich.

The minutes of the last meeting of the Conference were approved as printed.

The privilege of the floor was extended to Dr. W. C. Woodward, of Washington, D. C., representing the American Medical Association; Dr. M. I. Wilbert representing the Public Health Service, and Mr. J. Fred Windolph, of the Norwich Pharmacal Company.

The following report of the proceedings of the Executive Committee was read.

REPORT OF THE EXECUTIVE COMMITTEE.

A Meeting of the Executive Committee of the National Drug Trade Conference was held at the New Willard Hotel, Washington, D. C., December 9, 1914 in pursuance of a call of the President.

Meeting called to order by Chairman John C. Wallace at 11:45 a. m.

Present: John C. Wallace, Chairman; Charles M. Woodruff, Secretary; Samuel C. Henry, alternate for James F. Finneran; C. Mahlon Kline, and R. C Stofer.

The minutes of the last meeting were read and approved.

Mr. Samuel C. Henry then presented his credentials as alternate for Mr. Finneran, and they were duly accepted.

Mr. Kline moved that a committee of three be appointed by the Chairman to draft a resolution respecting the matter of a regulation admitting medicinal poisons to the mails and report same to the afternoon session.

Motion seconded, put to vote and carried.

The Chairman appointed Messrs. Kline, Henry and Woodruff as such committee.

The following communication from the Council of the American Pharmaceutical Association was then read:

"At a meeting of the Council of the American Pharmaceutical Association held August 29, 1914, the following resolution passed by the House of Delegates and referred to the Council was approved:

"'That the American Pharmaceutical Association instruct its representatives in the National Drug Trade Conference to act immediately in connection with the representatives of the large branches of the drug trade in the Drug Conference to draft at the earliest possible moment a bill to reform the present patent rights, registration of the names of drugs and the granting of sole right to sell certain drugs to the people of the United States, suitable to the best interests of the Drug Trade in the United States, and to urge its passage at the earliest possible opportunity, and the support of the A. Ph. A. is hereby pledged to such reform.'

"The action of the Council was approved by the Association at the following general session."

Mr. Kline moved that the communication be referred to the Conference with the recommendation that the Conference appoint a special committee to consider the matter, and report at the next called meeting of the Conference.

Motion carried.

Secretary-Treasurer Woodruff then read the following financial statement:

Receipts.

Balance on hand Jan. 9, 1914	$135.55	
Sept. 4, 1914, by amount charged National Association envelopes	2.34	
		$137.89

Expenditures.

Jan. 13. Stenographer at New Willard	.50	
Feb. 2. Postage, 100 2's	2.00	
Feb. 18. Postage, 100 1's	1.00	
Feb. 28. Parke, Davis & Co., for mailing packages	.55	
March 2. 200 Reprints, January meeting	6.50	
March 5. Postage, 100 1's	1.00	
March 30. Parke, Davis & Co. for mailing brief on Harrison Bill to members of Congress	4.28	
April 8. 1000 printed briefs on Harrison Bill	20.00	
April 24. Postage, 100 2's	2.00	
Aug. 17. Postage, 50 2's	1.00	
Sept. 4. Parke, Davis & Co.'s bill of March 5th for printing stationery	9.24	
Sept. 4. Parke, Davis & Co.'s bill of April 9, 1914, for printing resolutions of the Conference	13.76	
Sept. 10. Telegram sent Aug. 26th to J. Hampton Moore, Washington, D. C.	.96	
Sept. 15. Postage, 50 2's	1.00	
Oct. 8. Postage, 25 2's	.50	
Nov. 7. Mr. Brokmeyer for telegrams sent, to Aug. 28th inclusive	28.29	
Dec. 3. Telegram sent to Senator Townsend and Congressman Doremus respecting the Stamp Tax Bill	4.58	
		97.16
Balance on hand December 4, 1914		$40.73

A communication from the Philadelphia Drug Exchange was received, and referred to the Conference.

The Committee then adjourned to meet in the Gridiron Room at 4 p. m.

The Executive Committee met pursuant to adjournment at the Gridiron Room, December 9, 1914, 4 p. m.

Present: The entire committee.

The minutes of the forenoon meeting were read and approved.

The special committee appointed to frame a resolution on a medicinal poison regulation then offered the following:

Resolved, That the National Drug Trade Conference hereby renews the representations and recommendations it has made in the past respecting the mailing of medicines containing poisons not outwardly or of their own force dangerous, and urges upon the Postmaster General the necessity of immediately promulgating a regulation in accordance with the letter and spirit of Section 217 of the United States Criminal Code, that will permit of the economical and prompt distribution of some of the most valuable medicinal agents which are now denied the mails, and for the lack of which in the hands of the medical profession and drug trade, particularly in small places, inaccessible to express offices, human health and even life is often imperilled.

Resolved, That the Secretary be and he is hereby instructed to send a copy of this Resolution to the Postmaster General.

C. MAHLON KLINE,
S. C. HENRY,
CHARLES M. WOODRUFF.

Prof. Beal moved that the resolutions be approved by the Committee and referred to the Conference with the recommendation that they be adopted.

Motion carried.

The probability of the Revision Committee of the United States Pharmacopœia adopting the cylinder-shaped, separately-wrapped bichloride of mercury pastille of the German Pharmacopœia was discussed by Dr. Dohme, Prof. Beal, Mr. Kline and others.

Mr. Kline moved that a special committee of three be appointed to frame a protest against the plan and present same to the Conference at its meeting.

Motion carried.

The Chairman appointed Mr. Kline, Dr. Dohme, and Prof. Beal as such committee.

Chairman Wallace asked if there was any objection on the part of any member to his inviting a representative of the Public Health Service, and a representative of the American Medical Association to meet with the Conference to-morrow. No member of the Committee objected.

Prof. Beal moved that the Executive Committee recommend that the Conference invite the Proprietary Association of America to send three delegates to the Conference in accordance with Section (2) of the Code of Rules and Regulations of the Conference.

Motion carried.

Prof. Beal moved that Mr. Henry, Mr. Stofer, and Mr. Woodruff be appointed a special committee to confer with Mr. Talbot, of the Internal Revenue Department, respecting forms of order blanks under the Harrison Bill.

Motion carried.

After some remarks of general interest, the meeting then adjourned to meet again at the call of the Chairman.

Report received and ordered printed in the proceedings of the Conference.

Dr. A. R. Dohme moved the adoption of the following resolution:

Resolved, That this Conference go on record as favoring a revision of the United States Patent and Trademark Laws, and that in accordance with the recommendation of the Executive Committee a committee of five be appointed to carefully consider the entire question after conferring with other National organizations that are similarly considering the same and report back their findings to a subsequent meeting of this Conference.

Motion carried.

The President appointed as such committee: Dr. A. R. L. Dohme, Mr. J. H. Rehfuss, Mr. George W. Lattimer, Prof. James H. Beal, and Mr. R. C. Stofer.

The financial report of the Secretary, as contained in the report of the Executive Committee, was read and approved.

Mr. Henry moved that the resolution recommended by the Executive Committee respecting a regulation admitting medicinal poisons to the mails be adopted.

Motion carried.

The special committee appointed by the Executive Committee to present a resolution to the Conference respecting the probable adoption by the Revision Committee of the United States Pharmacopœia of the mercury bichloride pastille of the German Pharmacopœia then offered the following:

WHEREAS, We are informed that the Revision Committee are considering favorably for adoption in the next edition of the U. S. Pharmacopœia the German standard for Bichloride Tablets, and

WHEREAS, We believe that the German standard which is a cylindrical tablet colored pink and wrapped individually in paper would be dangerous to the public health inasmuch as candies are often of similar shape and are so wrapped, and also that the wrapping of the tablets would be detrimental to the health of the employe engaged in the work.

THEREFORE, Be it resolved that the National Drug Trade Conference go on record as opposed to this standard for bichloride tablets and that a copy of this resolution be sent to each member of the Revision Committee.

C. MAHLON KLINE, Chairman.
J. H. BEAL,
A. R. L. DOHME.

Dr. Burdick moved the adoption of the resolution.

Motion carried.

Prof. James H. Beal then moved that the recommendation of the Executive Committee that the Proprietary Association of America be invited to send three delegates to the Conference in accordance with Section (2) of the Code of Rules and Regulations be approved and that the Secretary be instructed to send such invitation.

Motion seconded and unanimously carried.

Mr. Rosengarten moved that the Secretary be instructed to invite the American Medical Association to send three delegates to the Conference in accordance with Section (2) of the Code of Rules and Regulations.

Motion carried.

The communication received from the Philadelphia Drug Exchange and referred to the Conference by the Executive Committee was then taken up, and discussed, and Mr. Kline moved that a committee of three be appointed to draft a suitable resolution and present same to the Conference at its afternoon session.

Motion carried.

The President then appointed the following nominating committee: Mr. Rehfuss, Prof. Beal, Mr. Rosengarten, Mr. Holliday and Dr. Burdick.

Mr. Henry inquired if any member could authoritatively inform him whether a druggist who sold some items on a commission basis could be taxed as a commission merchant. The Secretary expressed the opinion that he could not, and Mr Brockmeyer, who was present, read an analogous ruling confirming the Secretary's opinion.

Mr. Rehfuss moved that a special committee be appointed to file a protest with the Treasury Department against the double, and possible treble and quadruple taxation resulting from compelling the retail druggist to stamp packages he puts up from bulk packages already stamped and placed on his shelves.

Motion carried.

The President appointed Mr. Holliday, Mr. Rehfuss and Mr. Henry as such committee.

The Conference then adjourned to meet at four o'clock in the afternoon of the same day.

AFTERNOON SESSION OF THE CONFERENCE.

The Conference was called to order by the President, a quorum being present.

The Committee appointed to report to the Conference upon the communication received from the Philadelphia Drug Exchange then offered the following:

The committee to which has been referred the communication of the Philadelphia Drug Exchange respecting a proposed amendment of the section of the Federal Food and Drugs Act, governing the admission through the port of entry of drugs, the quality of which is under dispute or concerning the admissibility of which under the law there is a difference of opinion, respectfully report as follows:

1. The Committee is of the opinion that the evidence submitted indicates that, under existing practice, marked differences exist in the rulings at the different ports, whereby drugs which are refused at one port may be admitted at another.

2. That decisions regulating the admission of drugs are not enforced at all times at the same port of entry.

3. That the failure of the law to provide a method for review of the decision of the Secretary of Agriculture of the admissibility of a drug or chemical substance makes possible the existence of inequalities and lack of uniformity in drug importation, and may occasion instances of marked injustice to drug importers.

4. That the committee is not prepared at the present time to recommend a definite form of amendment for the correction of the faults referred to it, but does recommend that the whole subject be referred to a select committee of three, which committee should be instructed to co-operate with representatives of the Philadelphia Drug Exchange and of the Drug Trade Section of the New York Board of Trade and Transportation in an effort to obtain an amendment to that portion of the Food and Drugs Act which governs the admission to the United States of drugs submitted for entry as will bring a substantial correction of the faults complained of.

J. H. BEAL,
A. G. ROSENGARTEN,
C. MAHLON KLINE, Chairman.

On motion, the report was adopted and the committee was continued to act as the select committee referred to in the report. Dr. Beal declined to serve, and Mr. A. R. L. Dohme was appointed in his stead.

The committee appointed by the Executive Committee to interview the Commissioner of Internal Revenue respecting regulations, order forms, etc., under the Harrison Bill reported, verbally, that the Committee had been graciously received by Commissioner Osborne and referred to Mr. Talbot of the Law Division of the Internal Revenue office; that they had seen Mr. Talbot who expressed himself very anxious for the assistance and coöperation of the Committee; that the result of the interview was that Secretary Woodruff was to secure order blanks now used by the various manufacturers and wholesalers and submit same to Mr. Talbot that he might be guided thereby in determining the requirements of the trade also that Secretary Woodruff submit suggestions respecting the Record Book to be used under the Act.

On motion the report was accepted and approved and the committee continued to complete its work.

Mr. Stofer moved that each constituent association be assessed $50.00 to replenish the funds of the Conference.

Motion carried.

Mr. Henry moved that the Conference approve the Stevens Bill to secure price protection, being H. R. No. 13305.

Motion carried.

Dr. Dohme moved that the Secretary be instructed to cable Governor General, Francis Burton Harrison of the Philippine Islands, congratulations on the passage of the Harrison Bill.

Motion carried.

The Committee then reported the following nominations:

President, Mr. John C. Wallace.
First Vice-President, Mr. Charles A. West.
Second Vice-President, Dr. Wallace C. Abbott.
Third Vice-President, Mr. James F. Finneran.
Secretary-Treasurer, Mr. Charles M. Woodruff.

EXECUTIVE COMMITTEE.

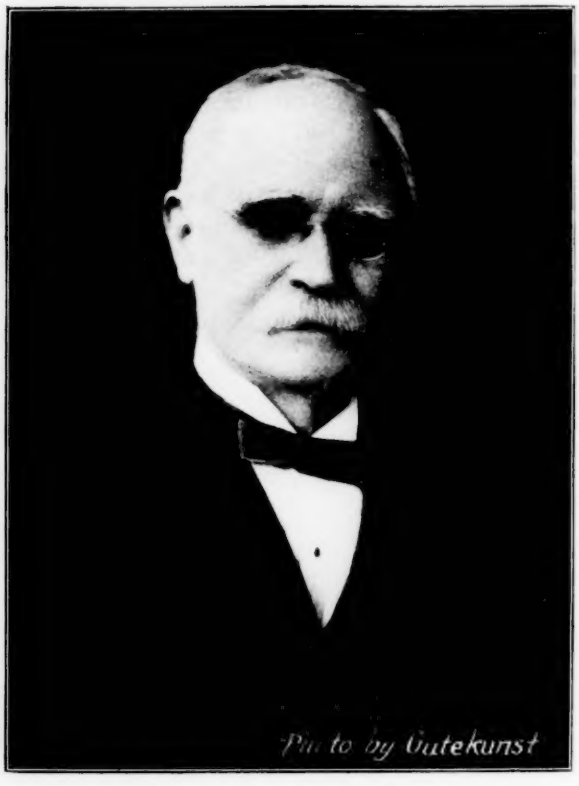
N. A. R. D., Mr. Samuel C. Henry.
A. Ph. A., Prof. James H. Beal.
N. W. D. A., Mr. C. Mahlon Kline.
N. A. M. M. P., Dr. A. R. L. Dohme.
A. A. Ph. C., Mr. R. C. Stofer.

On motion, the Secretary cast the ballot of the Conference for the persons named and they were declared elected.

On motion, the Conference then adjourned to meet at the call of the President, in accordance with the Code of Rules and Regulations.

CHARLES M. WOODRUFF,
Secretary.

EDWARD H. HANCE.*



Edward Hance Hance, founder and senior member of Hance Bros. and White, Inc., of Philadelphia, died on December 14, 1914, at the Germantown Hospital. He was eighty-one years old and had been ill for some time.

Mr. Hance had a long and active career. He was born in the Quaker City on November 1, 1833 and received his early education at a private school at Gwynedd, Pa. Later, he returned to Philadelphia, and entered the employ of Gilbert, Wentz and Co. and of Charles Ellis, Son & Co., and became a student at the Philadelphia College of Pharmacy, from which he was graduated in 1854, the subject of his thesis being *Chimaphila umbellata*. He had as his classmate the late John Wyeth, both of them destined to become important figures in American manufacturing pharmacy.

In 1855 Mr. Hance engaged in the manufacture of pharmaceutical and medicinal products on a large scale, the plant being first located near Fourth Street and York Road, in 1857 on Arch Street and 1860 at 509 North Street. Manufacturing Pharmacy was then in its infancy. In 1860 he formed a co-partnership with Mr. J. Clarkson Griffith under the firm name of Hance, Griffith and Co. The business of the firm grew rapidly and in 1867 the plant was moved to Callowhill and Marshall Streets, where it is still located. In 1869 Dr. James W. White became associated with the firm, and it became Hance Bros. and White, continuing as such until its recent incorporation as Hance Bros. and White, Inc.

Mr. Hance early identified himself with organization work. He became a member of the Philadelphia College of Pharmacy in 1857, and in the same year joined the American Pharmaceutical Association, becoming a life member.

But it was in the work of the Philadelphia Drug Exchange that he took the deepest interest. Elected as a member of the Board of Directors in 1869, he served as such for several years, and in 1873 was made President. During the following four years, he was an active member of the Board of Directors. With Mr. Alexander H. Jones and Mr. H. B. Rosengarten, he was most zealous in securing protection for the drug and chemical industries of the country and promoting their development. He devoted a great deal of time to the subjects of Mutual Fire Insurance for Manufacturers and Wholesalers and tax free alcohol for use in the Arts. He rendered especially valuable services at the time of the Centennial Exposition in pointing out the possibilities of growth of American manufacturing pharmacy. To his efforts and skill is credited most largely the wide-spread advertising that Philadelphia-made pharmaceuticals have received, both in this country and abroad.

In 1878 he was elected Treasurer of the Exchange and was continued as such until 1896, when he was, for the second time, made President. The following year he was again elected Treasurer and was continued in that office until his demise; a total period of service as Treasurer of thirty-six years.

He was one of the earliest members of the Union League, but resigned some years after the Civil War was over, and was an active member of the Philadelphia Board of Trade. He was a prime mover in the organization of the Philadelphia Bourse, being in hearty accord

*It is a curious coincidence that the photograph used in making the illustration of this sketch was taken by F. Gutekunst, of international fame as a photographer, who was a member of the class of 1853 of the Philadelphia College of Pharmacy.

with the objects of that organization and actively working to make Philadelphia and its manufacturing industries most widely known.

He took, also, a deep and active interest in the management of the Germantown Hospital, of which he was a director for many years.

Mr. Hance was widely esteemed for his many lovable qualities of character. "To a large circle of friends," as has been stated, "his death has its personal, poignant regret; to the mercantile and commercial world it marks the cessation of an active force which was of strong influence in the development and upbuilding of a large and important business; while to the community in general it completes a career of effort, and enterprise that was exceptional in its fruitful accomplishments and achievements."

Mr. Hance is survived by two sons—Anthony M. Hance and Edward H. Hance, Jr.

The funeral services were held at the late residence of the deceased, 104 West Tulpehocken Street, Germantown, Philadelphia, on Thursday, December 17th, 1914.

The services were conducted by Rev. Dr. C. H. Arndt, rector of Christ Protestant Episcopal Church, Germantown, and Rev. Dr. Samuel J. Upjohn, rector of the Lasher Protestant Episcopal Church, Germantown.

The honorary pallbearers were: William M. Coates, president of the Board of Trade; Harry H. Good, of New York; Harry B. Rosengarten, president of the Powers-Weightman-Rosengarten Company; Judge William H. Staake, of Common Pleas Court; Francis D. Gowen, General Counsel P. R. R.; George E. Bartol, president of the Philadelphia Bourse; Joseph C. Fraley, of Fraley & Paul, lawyers; William R. Tucker, secretary and assistant treasurer of the Philadelphia Board of Trade, and Consul for Russia; Harry B. French, president of Smith, Kline & French Co.; Dr. Richard V. Mattison, president of Keasbey & Mattison Co.; Richard M. Shoemaker, head of Robert Shoemaker & Co.; Walter V. Smith, president of Valentine H. Smith & Co.; A. Robinson McIlvaine, treasurer of Edward G. Budd Manufacturing Co.; Edward H. Long, head of John H. Long & Co.; Harold E. Gillingham, broker; Prof. Robert W. Blake; Thomas H. Shoemaker, and Harry A. Eveleth.

J. W. E.

GEORGE MERRELL.

"God's Finger Touched Him and He Slept."

On December 12, at his home in Cincinnati, George Merrell, the President of the William S. Merrell Chemical Company, "passed out of the shadow" into eternal rest.

Born in 1846, George Merrell had attained nearly the Scriptural limit of "three score and ten," rounding out a life full of Faith and Charity and Love for all Mankind, and his passing-away was one of those solemn lessons to all that our sands of life are running rapidly, and that we too, like him, should try to leave behind us "foot-prints on the sands of time," that will be of service to our fellows and to all Humanity.

Sprung from a brave New England ancestry, George Merrell embodied in his character, the sturdiness and firmness of the Puritan mingled with the geniality and the sympathy of the aristocracy of the Colonial life, in which brotherhood was felt more than in these material days. A son of a pharmacist, he knew the life and the work of a pharmacist, and thus could enter into intimate relations with the men of his profession.

The Civil War changed his course in life as it did that of many other young men of that trying period. He became a business man rather than a professional one, and developed the firm of the William S. Merrell Co., until it is known thruout the world for the reliability and efficiency of its drug-productions.

He was a 32° Mason, a charter member of the Society of Colonial Wars and the Sons of the Revolution, and an honorary member of many of the pharmaceutical associations in the country. He leaves a widow and three sons. They are Stanley W. Merrell, Judge of the Superior Court; Thurston Merrell and Charles G. Merrell. The following named gentlemen represented the Cincinnati Branch of the A. Ph. A. at the obsequies on Tuesday, the fifteenth ult:— Professors John Uri Lloyd, Charles Apmeyer, Theo. Wetterstroem, C. T. P. Fennell, Dr. A. Zwick, and Messrs. Fred Weissman, D. E. Murphy, Louis Werner, Frank H. Freericks, E. J. Voss, E. L. Pieck and E. H. Thiesing.

NECROLOGY.

GUSTAVUS A. KNABE.

Gustavus Alexander Knabe was born at Maryville, Tenn., July 8, 1853, and moved to Knoxville when only a few years old.

When but sixteen years of age, he entered the drug business as clerk for Chamberland and Albers, of Knoxville, Tenn.

He was graduated from the Maryland College of Pharmacy, class of 1876, and after having worked in the Gay Street Store of Charles Caspari, Jr., of Baltimore, removed to Washington, D. C., where he was employed at the National Hotel Drug Store, then conducted by Scheler and Stephens. After leaving Washington, he served for three years as apothecary on the U. S. S. "Vandalia."

In 1887, he purchased a store at Montgomery, Ala., and with his brother, Henry F. Knabe, conducted a most successful business up to the time of his demise.

Gus Knabe joined the American Pharmaceutical Association in 1876, becoming a life member in 1913.

He was an ardent Mason, holding several offices in his lodge; and was, also, a Knight Templar and a member of the Shrine.

He was a master of his daily work, brought honor upon his craft and won the esteem of all who came to know him.

J. W. E.

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THE ALPERS BANQUET.

The Northern Ohio Branch and the Cleveland School of Pharmacy tendered a complimentary banquet to Dr. and Madam Alpers on the evening of December 2., in recognition of the election of the doctor to the highest office in the gift of American Pharmacy. that of President of the American Pharmaceutical Association as briefly noted in the last issue. The occasion was one which was memorable in American Pharmacy and calls for more complete mention.

Among the guests were all those prominent in Cleveland Pharmacy, of whom may be mentioned: Mr. and Mrs. L. C. Hopp, Prof. and Mrs. J. Spenzer, Prof. P. G. Albrecht, Mr. and Mrs. John Krause, Mr. and Mrs. Wm. Hankey, Mr. and Mrs. Marshall, Mr. and Mrs. Carl Schmitt, Mr. and Mrs. Hechler, Mr. and Mrs. Petersilge, Mr. W. H. Gillmore, Mr. and Mrs. T. Pratt, Mr. and Mrs. Albrecht.

Mr. Lewis C. Hopp presided over the post-prandial exercises and welcomed the guests in an eloquent address testifying to the regard and esteem with which Dr. Alpers is held by the drug-world of Cleveland. Letters and telegrams were read from Prof. Joseph P. Remington, ex-President, G. M. Beringer, Prof. H. V. Arny, Geo. C. Dickman, Robert S. Lehman, Hugo Kantrowitz, Felix Hirseman, and Romaine Pierson of New York; Eugene P. Selters and Carl Winters of Cleveland, and Geo. B. Kauffman of Columbus, Ohio.

The various drug-interests of Cleveland were particularly represented by Mr. William T. Hankey, the Wholesale Druggists; Mr. E. Petersilge, the Retail Druggists; Mr. John Krause, the Cleveland School of Pharmacy; Professors Spenzer and Albrecht, the Faculty; Mr. Joseph Albrecht, the Alumni Association, and Mr. Henry Mitchell, the Student Body.

Dr. Alpers responded to their felicitous addresses as follows:

Your kind invitation to meet you here at this festive board was received with mingled feelings of embarrassment and pride. I am fully aware of the high honor that such a gathering confers, and deeply recognize the distinction that the receiver of this honor carries with him. I have asked myself again and again, if I really deserve such an elevation, and am afraid that my ability to serve you and the cause of pharmacy has been overrated and your friendship coming from the fullness of your good hearts has gotten the best of your sober judgment of my worth. This embarrassment, however, is coupled with pride, and I hope justified pride, that such a distinguished gathering as yours should have selected me for this high honor. It is therefore in the full recognition of your kindness and the sincere appreciation of your goodness that I express to you all my heartfelt thanks for this beautiful token of your friendship.

The immediate cause for this testimonial is my election to the presidency of the American Pharmaceutical Association. This office is considered by most as the highest honor within the gift of American Pharmacy and is valued accordingly by all members. I am particularly gratified at my election just at this time for the reason that the year of my presidency will be the twenty-fifth anniversary of my membership. I know that to a great extent I owe my nomination to my dear friend, Mr. Lewis C. Hopp, our genial toastmaster, who himself is an ex-president of the Association. My election by a handsome majority showed me the love and esteem of my

fellow members in the Association and I may be pardoned to confess that the moment when I received the announcement of the vote was one of the happiest of my life.

Of all earthly goods I value my membership in the American Pharmaceutical Association the highest. It has been to me a source of infinite joy, satisfaction, learning, instruction, inspiration and blessing. From the first moment that I entered the meeting of the Association—it was at the memorable meeting at the Profile House in the White Mountains—I knew that I had joined a circle of men with whom to associate was a pleasure, a benefit, an honor. I at once saw the immense field of work that this Association had laid out for its loyal members and I also recognized my own shortcomings. But the revelation that this first meeting brought me, became a spur to work, to study and try to become a peer or even a leader among these men of the highest type. It taught me by a convincing lesson that strict loyalty and upright faithfulness to the higher causes of pharmacy would alone be able to battle with the many impeding obstacles and that this battle was a worthy object, and victory the highest ideal, of a true pharmacist's life. This first impression has never left me, it has become firm conviction and will remain with me as long as I live. In this sense I have worked and fought in the councils of the Association, always true to my convictions, and fearless when I had recognized what I considered true and right. Not that I claim that I always was right; nobody can say that he is right all the time, but no matter how different the opinions of leading men were, how fiercely the battle of argument was waged, I never thought less of my opponents, listened to their words with respect, and weighed them carefully. It is thus that truth and right will come to the surface and finally prevail. And how wonderfully do such battles of brains and conviction shine in comparison with the battles of a terrible war, where victory and murder become identical and the destruction of the works of civilization is called a great deed. Here both gain, victor and vanquished, and far from hating or despising each other, become true friends by the recognition of each other's worth and courage. This loyalty and devotion to the causes of pharmacy shall be the guides during my presidency and with the aid of my fellow officers and friends I hope to become a worthy successor to the many excellent presidents that have in the past shaped the destinies of the American Pharmaceutical Association.

I cannot close my remarks without adding a few words to you, my Cleveland friends, in special and tell you how deeply I am affected by your kindness this evening. It is not quite a year that I came to you, unknown to most of you, and took charge of the School of Pharmacy. From the very first day I met with the kindest welcome and warmest reception by all. Pharmacists, students, trustees, fellow-teachers, and also the ladies of Cleveland, the sweet pharmacisters, seemed to envy with each other to make my stay pleasant and my work successful. And when I saw the great opportunities that Cleveland presented to a loyal and earnest teacher, I at once knew that I had found the right place. I plunged into my work with enthusiasm and energy. I gave the students the best that was in me, and watched over each one with the love and full interest that my responsible position demanded. I have been every day, since my arrival, the first one at the school in the morning and the last one at night, believing that a Dean's loyalty requires him to devote his whole time to the great and beautiful work that such an institution affords. I have prepared every lecture carefully and conscientiously and endeavored through word and example to implant into the hearts of the students a deep-seated love for their profession and devotion to their work. In this ideal conception of my duties, I have received the support and assistance of the trustees and members of the school and we have, by joint work and efforts, been able to create a beautiful and flourishing college. But, I consider the present success only the beginning of my work, and hope that each year will surpass the preceding one in good results.

After these words, I need not tell you that I feel happy here in Cleveland, in your midst, and I assure you that this gathering, and this beautiful token of your friendship and esteem, will be a new inspiration to serve you and pharmacy better and more faithfully than before.

Proceedings of the Local Branches

CHICAGO.

The regular monthly meeting was held Tuesday evening, December 15th, following a dinner in honor of Dr. J. H. Beal, who, on account of his recent change of residence to Illinois, now becomes a member of the Chicago Branch.

At the meeting were gathered representatives of the various pharmaceutical interests of Chicago, to discuss proposed amendments to the state pharmacy law. The meeting was especially timely as an important conference of the pharmaceutical interests of the state will be held in January at Springfield, under the auspices of the State Board of Pharmacy, with the aim of framing desirable amendments to the Illinois pharmacy law.

President Jas. H. Wells presided and introduced Mr. Leo. L. Mrazek, of the State Board of Pharmacy, who presented for discussion

the recommendations of the Board in its recent report to the Governor. These recommendations embraced, first, certain changes in the anti-narcotic sections to make them conform to the model "anti-narcotic" law. In the discussion that followed, Mr. Thos. Potts read the anti-narcotic sections of the Indiana Law, and stated that excellent results in suppressing the illegal use of narcotics were being had under this law. Messrs. Irwin A. Becker, S. K. Sass, H. C. Christensen and others favored the changes in the anti-narcotic sections as recommended by the State Board.

The second recommendation of the Board was as follows:— Making it unlawful for any individual to have in his possession more cocaine or eucaine than can be obtained by means of prescription from a regularly licensed physician, exception to be made in the case of registered pharmacists, physicians, dentists, veterinarians, and hospitals. In the discussion, in which Messrs. J. Riemenschneider, Hugh Craig, C. E. Storer, and others participated, it was pointed out that physicians' prescriptions not unfrequently called for undue amounts of cocaine.

The third recommendation—that of a college pre-requisite requirement from candidates for examination as registered pharmacists, after a brief discussion by Professor W. B. Day, was unanimously adopted.

A fourth recommendation—a penalty for false representation as to being registered in Illinois as apprentice, assistant pharmacist or registered pharmacist, was adopted.

Dr. Beal told of some of the activities of the Drug Trade Conference meeting just concluded in Washington. The chief matters of discussion were the operation of the Harrison Bill, recently passed by Congress, the various stamp tax decisions; the evils of law making by bureaucratic rulings and the need of modification of our present patent laws.

Mr. Light spoke of the protest made by the Chicago Retail Druggists' Association against a proposed bill to be presented to the legislature at Springfield, by the Chicago City Council, to empower it to license, tax and regulate drug stores.

A nominating committee, consisting of Messrs. Gray, Becker and Sass, to report previous to the annual election of officers, at the next meeting of the Branch, was elected. Upon motion, also, the date of the next meeting was changed from Tuesday, January 19th, to Friday evening, January 22d, so as to enable members in attendance at the Springfield Conference, January 18th and 19th, to be present and report at the Branch meeting.

E. N. GATHERCOAL, Secretary.

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CINCINNATI.

The regular monthly meeting was held at Lloyd Library, December 15. President E. H. Thiesing occupied the chair. The minutes of the last monthly meeting were approved.

The President announced the death of our esteemed member, G. M. Merrell. The following members had been appointed to pay the last respects of the local branch at the funeral service:— Messrs. D. E. Murphy, Frank H. Freericks, Louis Werner, Edw. Voss, Jr., C. T. P. Fennel, C. A. Apmeyer, F. W. Weissmann, E. H. Thiesing, J. U. Lloyd, Theodore Wetterstroem.

On motion of Frank H. Freericks, the President selected Prof. J. U. Lloyd as chairman, with Frank H. Freericks and Julius Greyer, to act as a committee to frame a suitable resolution of condolence on the death of Mr. Merrell.

Mr. Frank H. Freericks, as chairman of the Committee on Legislation, spoke of the advanced legislation contemplated on the sale and distribution of narcotic drugs.

Prof. J. U. Lloyd, as chairman of the Committee on National Home, spoke of the advantages of Cincinnati for the selection of a site for same.

Miss Bertha Ott presented an excellent and exhaustive paper on "Belladonna," treating her subject from an historical, pharmaceutical and medical standpoint, and also giving quite a few facts and possibilities, regarding the cultivation and preservation of this valuable drug.

Miss Ott received a vote of thanks and was highly complimented on this excellent paper. The Secretary was directed to forward same the Editor, with a request to have this paper published in the Journal.

Mr. Wetterstroem suggested that pharmacists and government officials should use their influence and help to instruct the intelligent and willing farmer, through the "Farmers' Institute," upon the importance and feasibility of cultivating medicinal plants.

Prof. Lloyd emphasized the importance of the history and origin of a drug and asserted

that a great many valuable remedies were originally brought to the notice of the scientific man from outside sources.

The discussion was participated in by several other members, after which the President called upon Mr. Chas. Ehlers, who chose for his subject, "Discussion on U. S. P. and N. F. Preparations." Among others, he took up the Glycerite Iron, Quinine and Strychnine, setting forth that by changing the proportion of the glycerine and water, in a slight degree, a much more permanent preparation will be obtained. He also referred to Syrup Wild Cherry, Liquor Cresolis Comp., Liq. Antisept. Alkal., Elixir Digestiv. Comp., Elix. Iron, Quinine and Strychnine, claiming, improvement may be had by slight changes either in formulas or modes of preparation.

He proposed a modified formula for preparing Solution Aluminum Acetate, stating a permanent 7% solution may be obtained by the following:—

Lead Acetate	600 grains
Alum	360 grains
Sodium Sulphite	60 grains
Water—ad	10 fl. ozs.

An interesting discussion resulted, regarding these preparations, which was taken part in by Messrs. Lloyd, Wetterstroem, Apmeyer, Freericks, Greyer and others.

CHAS. A. APMEYER, Secretary.

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COLUMBUS.

The December meeting was held in the Y. M. C. A. rooms on Wednesday evening, December 9, with President Topping in the chair. The principal address of the evening was made by Mr. Charles P. Hoover, the chemist in charge of the filtration plant of the water supply of the city. His address was a most interesting description of the treatment of an unsanitary water, to make it potable and sanitary, and was accompanied with demonstrations of the effect of certain chemicals upon the river water-supply, and was also illustrated with charts.

An interesting discussion on Parliamentary Law was evoked by the presentation to the Branch of a copy of the latest edition of Cushing's Parliamentary Practice by Mr. Marshall, during the course, of which, many amusing blunders in parliamentary practice in pharmaceutical meetings were stated and criticized.

Dr. C. A. Dye reported the organization of the Membership Committee and stated that the outlook at this time was favorable.

Mr. Young reported for the Joint Committee with the O. S. P. A., on the Medicinal Plant Garden for the University. He stated that the committee were working with the matter and had made a good start. That they were at the present time going over some literature and statistics and he would have a report by the next meeting that would be of more interest to the Branch.

Dr. Dye reported for the Program Committee that the program for the winter had been practically completed and that the Branch would hear some good papers and some good addresses by quite a number of interesting speakers. He further stated that, the speakers would not be all pharmacists but that several chemists in other lines of work had promised to address the Branch.

Dr. Dye presented a written motion to amend the By-Laws that Chapter IV, Article 1 of the By-Laws be amended to read that "Regular meetings shall be held on the second Wednesday of each month."

This motion was received and according to the Constitution will be voted upon at the next meeting.

The President then made a few remarks of welcome to the university students who were in attendance at this meeting, and assured them that they were welcome and that the Branch would be glad to have them attend as many meetings of the Branch as they could.

Dr. Dye then moved a vote of thanks by the Branch to Mr. Hoover and stated that this was one municipal enterprise that had been run without a stain. Seconded by Mr. Young. Unanimously carried.

Dr. Dye moved that the meeting of the Branch adjourn to meet the second Wednesday in January. Seconded by Mr. Will. Carried.

Adjourned at 10:15.

EDWARD SPEASE, Secretary.

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DETROIT.

The Detroit Branch was organized on December 11, 1914, and the following officers were elected:—

President, W. A. Hall; Vice-President, A. A. Wheeler; Secretary, Wilbur L. Scoville;

Treasurer, C. F. Mann; Representative on the Council, L. A. Seltzer.

There was a goodly attendance of the Detroit A. Ph. A. members, and it was decided to hold meetings monthly. Mr. H. B. Mason is the chairman of the Program Committee for the year, and a Committee on By-Laws is expected to report at the next meeting, on January 20th.

Dr. E. R. Larned inaugurated the scientific course by an illustrated lecture on Opsonins and Bacterial Vaccines.

The influence of bacteria and bacterial products on the human system was described and illustrated, and the method for taking the opsonic index of a patient given in full. The manufacture of bacterial vaccines was then described fully and some suggestions given for their use. A lively discussion followed the lecture.

Detroit and Ann Arbor both contain an abundance of able talkers and some very interesting papers are expected in the near future. Ann Arbor is included in this Branch, as are the other near-by towns.

WILBUR L. SCOVILLE, Secretary.

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NEW YORK.

The November meeting of the New York Branch of the American Pharmaceutical Association was held on the evening of the ninth. The meeting opened with President H. V. Arny in the chair.

On motion duly carried, the reading of the minutes of the previous meeting was dispensed with.

Treasurer Weinstein read his report, which was approved.

T. D. McElhenie, reporting for the Council, stated that there had been considerable discussion as to the feasibility of the American Pharmaceutical Association participating in a pharmaceutical exhibit at the coming Panama-Pacific Exposition at San Francisco. Certain members of the Council were in favor of the association making an exhibit, while quite a large percentage of the Council questioned whether or not it would be of sufficient interest to the general public to warrant the expense. C. O. Bigelow, in commenting on Mr. McElhenie's report, stated that the New York College of Pharmacy as an institution had voted against the working exhibit proposition last winter.

No reports were made for the Education and Legislation, Progress of Pharmacy, Membership, or Fraternal Relations Committees as the Chairmen of the various committees were absent. Dr. Diekman, Chairman of the Progress of Pharmacy Committee, sent a note explaining that he was ill and for that reason unable to attend.

The Secretary then read a communication from J. W. England, Secretary of the Council of the parent body, to the effect that papers prepared by A. Ph. A. members must be reserved for initial publication in the Journal of the American Pharmaceutical Association.

President Arny suggested that a dinner should be given in honor of Mr. Caswell A. Mayo, President of the parent association, and C. O. Bigelow made the motion, which was duly seconded and unanimously carried, and it was decided that the dinner should be given some time during the early part of January and that the various local pharmaceutical associations should be asked to cooperate with the New York Branch in tendering the dinner to Mr. Mayo.

Dr. Arny suggested that the local Branch invite Dr. Edward Kremers of the University of Wisconsin to address the members on "The History of Pharmacy" but, after the matter was discussed, it was decided that the New York College of Pharmacy endeavor to have Dr. Kremers give his lecture at one of their early meetings.

The speaker of the evening, Joseph L. Turner, was then introduced and a very interesting paper prepared by himself and Mr. Ralph C. Holmes on "Estimation of Cineol in Oil of Eucalyptus" was read and illustrated. This paper will be printed later in the Journal. It was discussed by Messrs. Raubenheimer, Murray, Mansfield and Wimmer.

Dr. Mansfield was asked to discuss the eucalyptus leaf from a botanical viewpoint, which he did, and at the same time he displayed a specimen of the prime eucalyptus leaf.

Otto Raubenheimer moved that a copy of the paper presented by Messrs. Turner and Holmes be promptly forwarded to Professor Joseph Remington, Chairman of the Committee of Revision of the U. S. P., which motion was carried.

Upon the motion of Dr. William Mansfield, Messrs. Turner and Holmes were given a vote of thanks.

Under the heading of new business, T. D.

McElhenie displayed a bottle of Rhodes Astringent Hair Lotion, the carton and label of which both indicated that the product contained 40 per cent. methyl alcohol. The preparation is manufactured by Arthur Rhodes, Lowell, Mass. He called attention to the deleterious effect of methyl alcohol when used internally or externally and expressed his surprise that any manufacturer should be bold enough to use methyl alcohol in the preparation of a product such as a hair tonic or lotion. He further called attention to the fact that in Greater New York such a product could not be legally sold and indicated that the same applied in a great many other sections.

The meeting was then adjourned.

FRANK L. MCCARTNEY, Secretary.

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PHILADELPHIA.

The regular monthly meeting was held on Tuesday evening, December 8, at the Temple College of Pharmacy.

In the absence of President E. Fullerton Cook, Vice-President J. W. Sturmer called the meeting to order at 8:15 p. m. The minutes of the last meeting were read and approved.

A communication from The Pearson Publishing Company, in answer to the resolution passed at the November meeting, concerning the article, "Pills and Piracy," in Pearson's Magazine, was read. The full text of the letter is as follows:—

Dear Sir:—We acknowledge receipt of your letter of the 16th inst. We can express no regret at the publication of the article to which you refer. The chief complaint of pharmacists seems to be that the author of the article knows nothing about pharmacy. That's just the point. The average man knows nothing about pharmacy, but no pharmacist has denied that it is a practice to charge more for the simplest medicines when a doctor's prescription is presented than is charged when a man merely asks for the medicine. No pharmacist has given us a good reason for this.

However, we want to be right about this as we want to be right about everything else. We have offered space to various pharmacists for an article on the other side of the matter. We offer such space to you.

Yours very truly, (Signed)

THE PEARSON PUBLISHING COMPANY.

It was moved by Prof. C. H. LaWall that a committee of three be appointed to draw up an answer to this letter. The motion carried and the following committee was appointed for that purpose:— Prof. LaWall, Franklin M. Apple and Charles Leedom.

The program of the evening was then taken up and Mr. Harry B. French discussed "The Influence of the European War on the Supply and Cost of Drugs and Chemicals."

Dr. George H. Meeker read a paper on "Vitamines in Their Relation to the Complete Diet."

"The Review of Current Pharmaceutical Literature" was presented by Prof. Freeman P. Stroup.

A vote of thanks, as proposed by Mr. J. W. England, was given to the contributors of the program, after which the meeting adjourned.

Respectfully submitted,

J. ED. BREWER, Secretary.

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PITTSBURGH.

The Branch held its first meeting for the season of 1914-15, Friday evening, December 11th.

The attendance was encouraging and the proceedings exceptionally instructive and interesting.

The program consisted of the following promising subjects for elucidation and discussion: "Diatoms," (illustrated), by Dr. L. K. Darbaker and Dr. F. J. Blumenschein, "The War Tax," by B. E. Pritchard. "A Note on Zinc Oxide Ointment," by Dr. Louis Emanuel.

The illustrations thrown upon the canvas of the many beautiful markings to be found on diatomaceous earths were greatly appreciated, and were a source of surprise and wonderment at their number and range of variation. The descriptive talk by Dr. Darbaker was helpful in directing attention to these markings, while the character of the various kinds of these earths and the sources from which they are obtained by Dr. Blumenschein, were both appreciated by the audience. In the discussion following, many astonishing features concerning these earths were brought out, showing what an intensely interesting study they constitute. In this discussion Dr. J. A. Koch, President Andrew Campbell and Dr. J. H. Wurdack participated, and each speaker disclosed a wide knowledge of the subject that was another surprise, as most of those present were hearing all these things for the first time.

The "War Tax" talk was a feature that

came a little closer to the every-day things that occupy our thoughts in business problems, and the speaker said, that this measure is a problem in its complexities that "no fellow can find out" is not to be questioned. It is the concensus of opinion that "it is a piece of legislation that was entirely uncalled for, and only carried out as one more way out of the woods for the administration to cover up the damage done by the last Tariff law." Analysis of the measure in its text, shows it to have been very loosely and carelessly drawn, and reference to the various rulings issued by the Internal Revenue Department, taken in connection with the law in its wording, shows many inconsistencies and absurdities. Attention was directed to the good work of the various drug trade organizations in succeeding in having so-called patent medicines eliminated from the provisions of the bill, which was appreciated.

Dr. Emanuel's Note on "Zinc Oxide Ointment" dealt with the action of the U. S. P. Revision Committee, retaining benzoated lard as a base for zinc oxide ointment, and the opposition to that action among many pharmacists because of its proneness to rancidity, which is not the case where petrolatum is used. Dr. Emanuel favored the lard-base, for reason that the ointment under discussion has gained its wide reputation as a healing agent under the use of that base, and should petrolatum not prove as therapeutically efficient as a base, this popular medicament may lose its reputation, and thus one more old, time-tried remedial agent will be forced out of our materia medica. Dr. Emanuel called attention to the wide use of the petrolatum base, and warned pharmacists that its use may lead to prosecution under the Federal drugs act, as well as under the drugs acts found on the statute books of a number of states.

The Committee on Nomination of Officers to be voted for at the January meeting presented the following slate:— President, George W. Kutscher; First Vice-President, Peter G. Walter; Second Vice-President, Leonard K. Darbaker; Third Vice-President, Jesse J. Doyle; Secretary, Benjamin E. Pritchard; Treasurer, P. Henry Utech. For chairmen of the various committees:— Program, Frederick J. Blumenschein; Publicity, B. E. Pritchard; Practice, Louis Saalbach; Membership, J. H. Wurdack; Education and Legislation, Andrew Campbell; Medical Relations, Albert F. Judd; Member of Council, three-year term, Julius A. Koch.

B. E. PRITCHARD.

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SAINT LOUIS.

Thirty-five members were in attendance at the meeting of the Saint Louis Branch, held in the St. Louis College of Pharmacy, December 18, 1914. The program of the evening was a most interesting one. Dr. H. M. Whelpley spoke on the subject, "Why The American Pharmaceutical Association?" Prof. Francis Hemm led in the discussion of Dr. Whelpley's paper, and stated that the bound volumes of the Association's yearly proceedings are the best reference books a pharmacist can own.

Dr. Leo Suppan gave an informal talk on "Historical Pharmacy of Missouri" and "The Missouri Pharmaceutical Association Exhibit at the Missouri Historical Society, Jefferson Memorial Building, St. Louis." He gave an interesting account of the early pharmacy of Missouri, and strongly urged the pharmacists of the state to take an active part in the collection of important historical material, relating to pharmacy.

JULIUS C. HOESTER, Secretary.

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WASHINGTON, D. C.

The regular December meeting was held December 16, 1914, at 8:00 p. m., at the Institute for Industrial Research, Nineteenth and B streets, N. W., Washington, D. C.

The election of officers resulted in the following, all of whom were elected unanimously:—

President, Dr. H. E. Kalusowski; First Vice-President, Henry B. Floyd; Second Vice-President, Dr. W. W. Stockberger; Secretary, S. L. Hilton; Treasurer, W. S. Richardson. Chairmen:— Committee on Publicity, Dr. Lyman F. Kebler; Medical Relations, Frank C. Henry; Membership, Wymond H. Bradbury; Scientific Communications, H. C. Fuller; Legislation, G. W. Hurlebaus.

After the disposition of the business before the meeting, President Richardson introduced Dr. C. D. Marsh, of the Department of Agriculture, who lectured on "Poison Plants Found on the Stock Ranches." His graphic descriptions of these plants and their ravages, illustrated by many lantern slides, some of

which were naturally colored, were exceedingly interesting, and an education almost in themselves. Most of his remarks were devoted to the *Cicuta*, or Water-hemlock, the Loco, and Larkspur. The effects of these poisons, and the rapidity of their action, were shown by a number of views of various cattle and sheep, taken but a few minutes apart.

The reading of Dr. William Salant's paper on "*Chenopodium*, (American Wormseed)", was postponed, because of the lateness of the hour, to a meeting in the near future.

Both Mr. Richardson and Dr. Marsh were given votes of thanks at the close of the meeting, the former for the unusually attractive programs he has secured the branch for the year, the latter for his most excellent and instructive entertainment.

Very truly yours,

HENRY B. FLOYD.

Council Business

COUNCIL LETTER NO. 10.

To the Members of the Council:—

The following Budget of Appropriations for 1915 is submitted by the Committee on Finance:—

PROPOSED BUDGET OF APPROPRIATIONS FOR 1915.

Appropriation.	
No. 1 Salaries	$ 5500
No. 2 Journal	6600
(a) Publication $5000	
(b) Clerical Expenses 900	
(c) Postage and Stationery 450	
(d) Freight, Drayage and Miscellaneous 250	
No. 3 Printing, Postage and Stationery	900
No. 4 Clerical Expenses Secretary's Office	416
No. 5 National Formulary	1000
No. 6 Miscellaneous Expenses	100
No. 7 Drayage, Freight and Expressage	100
No. 8 Stenographers	350
No. 9 Travelling Expenses	600
No. 10 Committee on Membership	250
No. 11 Committee on Unofficial Standards	100
No. 12 Year Book	2500
No. 13 Badges and Bars	50
No. 14 Certificates	50
No. 15 Premium on Treasurer's Bond	50
No. 16 National Drug Trade Conference	200
No. 17 Journals for Reporters	35
No. 18 Section on Scientific Papers	25
No. 19 Section on Education and Legislation	25
No. 20 Section on Commercial Interests	25
No. 21 Section on Practical Pharmacy and Dispensing	25
No. 22 Section on Historical Pharmacy	50
No. 23 Committee on Pharmacopœias and Formularies	25
No. 24 Women's Section	50
No. 25 National Syllabus Committee	25
	$19,051

At the Detroit (1914) meeting of the Association, the Section on Pharmacopœias and Formularies was abolished, but there was created, as a sub-division of the Section on Practical Pharmacy and Dispensing a Committee on Pharmacopœias and Formularies.

Do you approve of Budget of Appropriations for 1915 as above proposed? This will be regarded as *Motion No. 19 (Approval of Budget of Appropriations for* 1915.)

J. W. ENGLAND,
Secretary of the Council.

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COUNCIL LETTER NO. 11.

December 15, 1914.

To the Members of the Council:—

The following communication has been received:—

"Members of the Council, Gentlemen: It will be recalled that in Council Letter No. 2 (October 2, 1914), the subject of giving the Committee on Publication enlarged powers, etc. (as recommended at the Detroit (1914) meeting in President Beringer's address, approved by the Association and referred to the Council) was discussed, and under Motion No. 3, the Council authorized the Committee on Publication to effect a re-organization and to systematize its work.

Your Committee on Publication has been giving careful consideration to the subject and would report as follows:—

Article 11, Chapter V, of the by-laws of the Association relating to the Treasurer reads: "He shall pay no money except on the order of the General Secretary, accompanied by the proper voucher."

Rule Third of the General Rules of Finance, as adopted at the Detroit (1914) meeting reads:—

"The correctness of every bill shall be certified to by the person contracting the same and the General Secretary, and the latter

shall note on the bill the appropriation against which the same is to be charged. The bill shall then be submitted to the Chairman of the Finance Committee for approval before payment is made. A warrant shall then be drawn and signed by the General Secretary, upon receipt of which, together with the original bill and voucher, the Treasurer shall draw a check for the amount."

This rule superseded former Rule Third of the General Rules of Finance (Year Book, 1912, XXXII.)

It should be noted that both the by-law and rule are in full force and effect.

President Beringer recommended in his annual address that the Committee on Publication be given more extended power in the conduct of its work, and this recommendation was referred to the Council which authorized the Committee to effect a reorganization and to systematize its work, i. e. to organize a proper clerical and editorial staff so as to efficiently conduct the business of the Committee. It was suggested that to avoid the delay incident to the present method of paying the bills of the Association, the Committee's appropriation be paid to it quarterly, and that the Committee elect a Treasurer who should honor drafts made by the Editor and counter-signed by the Chairman and keep correct accounts of all receipts and expenditures on behalf of the Committee subject to the approval of the Council and Auditing Committee thereof.

But it is a serious question, in the light of Article 11, Chapter V, of the by-laws and Rule Third of the General Rules of Finance, as above quoted, whether we have the authority to pay bills other than through the General Secretary and Treasurer and as indicated.

The "by-law" was not amended at the Detroit meeting, and the "rule" was newly enacted, and both are in direct conflict with the plan proposed for the business of the Committee.

Fortunately, a careful study of the situation seems to indicate that it is not necessary to inaugurate the plan of paying bills proposed, but that, with the formulation only of certain new "Rules of Publication," we can gain the end desired.

The objects aimed at are to control the expenses of the Journal and publications of the Association, to secure the prompter payment of bills, more especially bills requiring immediate payment, such as those for postage, drayage, expressage, etc., and to relieve the Editor from the necessity of advancing money from his own pocket to pay the bills of the Association.

To this end the following rules are recommended for adoption:—

GENERAL RULES OF PUBLICATION.

1. All bills on account of the Journal shall be certified to by the Editor and sent as soon as possible to the Chairman of the Committee on Publication for approval and then sent by the latter to the General Secretary for payment in accordance with Article 11, Chapter V, of the by-laws and Rule Third of the General Rules of Finance, except bills for postage, stationery, drayage, freight, expressage, miscellaneous and clerical expenses of the Office of the Journal (Petty and Clerical Expenses, Journal Office) which shall be paid as provided for in Rule 2 of these rules.

2. Bills for postage, stationery, drayage, freight, expressage, miscellaneous and clerical expenses of the office of the Journal (Petty and Clerical Expenses, Journal Office) shall be paid by check by the Editor of the Journal out of a deposit of $300 to be made to the credit of the Editor of the Journal by the American Pharmaceutical Association in a bank to be approved by the Committee on Publication.

The Editor shall be bonded for $500 at the expense of the Association.

The procedure for the payment of such bills shall be as follows:—(1) At the end of each month, the Editor shall send all paid-and-receipted bills and cancelled checks, with an itemized bill or statement, to the Chairman of the Committee on Publication for approval; (2) After approval, the Chairman of the Committee on Publication shall send the bills and checks to the General Secretary; (3) the General Secretary shall draw an order for the amount of the bills in accordance with Rule Third of the General Rules of Finance and forward the order and bills to the Treasurer; and (4) The Treasurer shall send the Editor a check to cover the amount of the bills and thus increase the bank balance.

3. All bills on account of the Year Book, National Formulary and other publications of the Association shall be certified to by the person contracting the same and approved by the Chairman of the Committee on Publication and sent by the latter to the General Secretary before payment in accordance with Article 11, Chapter V, of the by-laws and Rule Third of the General Rules of Finance.

The advantages of this method are many. It is simpler than having a Treasurer of the Committee through which to pay bills, and it does not require that one-fourth of the annual appropriation of each item of the work of the Committee shall be paid each

quarter to the Treasurer. The present machinery for the payment of bills is continued, the only change being the control to be given to the Chairman of the Committee on Publication in the payment of bills. In addition, the items of the annual budget of appropriations will not need to be changed.

Furthermore, the $300 is practically advanced or loaned to the Editor under bond and the bills are really not finally paid by the Association until the Treasurer sends the check each month to cover the amount of vouchers paid, so that the Association is protected in every way.

The above proposed "Rules of Publication" were submitted to Julius A. Koch, Chairman of the Finance Committee, and he heartily endorses them.

In this connection, General Secretary Day writes as follows:—

"I have Letter No. 8 of the Committee on Publication. I like the plan of placing a fund of $300 in the hands of the Editor from which he is to make by check such disbursements as may be necessary to cover the small expenses of his office. This amounts practically to establishing in the Editor's office a petty expense fund.

"As Actuary of the School of Pharmacy I have for years had such a petty expense fund. You may be interested in knowing how I manage this fund. The amount deposited with me by the University for this fund was $250. I placed this amount in my bank subject to check but separate from my personal checking account. I draw the checks from the petty expense fund as W. B. Day, Actuary. At the end of each month I report to the business office of the University the condition of the fund and turn in a bill for the expenditures of the month with the receipts for the individual items of expense attached thereto. A duplicate of this bill is retained for my files. The University check for the amount of this bill is sent to me in due time, thus restoring original amount of the fund. My cancelled checks are my personal receipts for the expenditures from this fund and are retained in my office. I am thus able at a moment's notice to give a statement of the condition of this petty expense fund and to make a complete accounting therefor. I think some such plan might be followed if the proposed petty expense fund for the Editor's office is decided upon. You may record me as being in favor of this plan."

The Committee on Publication submits the above "Rules of Publication" for your consideration and asks that they be approved.

Very truly yours,

J. W. ENGLAND,

Chairman of Committee on Publication."

Further communications have been received relative to *Motion No.* 17 (C. L. No. 7), as follows:—

John B. Thomas writes:—

"Replying to A. Ph. A. Council Letter No. 9, it seems to me that it would be best to table Motion No. 17 right now.

"Although I voted to extend the invitation and would have heartily welcomed the acceptance of the same, I fear that further discussion of this motion might be resented and result in a lack of harmony in our own ranks.

"In my opinion, we cannot afford to entertain this subject at this time."

Thomas D. McElhenie writes:—

"Relating to the matter of invitation to the Japanese Pharmaceutical Association, I think if there is yet time I will ask leave to reverse my vote to the negative. It seems to me very likely that Dr. Schneider was actuated probably by a feeling of good fellowship coupled with the natural enthusiasm of a local Secretary to make his meeting a notable success, and as a well-known scientist he very likely has friends and correspondents in Japan and probably throughout the world and may be familiar with the Japanese language, but did not think of the long, long way from Tokio to Frisco. I scarcely think that the Japanese Society would take the matter seriously. They could not possibly muster enough of their members in San Francisco to hold a regular meeting of their own body and they could not understand the proceeding of our meeting except by the use of interpreters, which would be burdensome and tedious. Besides, there is the duty of host for our Association to the visitors and no fund available for such use.

"If there is a national body of pharmacists in Mexico or Central America they might like to meet in Frisco, but the same difficulty of language would prevail."

L. E. Sayre writes:—

"In response to your request that there be an expression of opinion in regard to the invitation to the Pharmaceutical Society of Japan, I would say that, after reading the communications contained in Letter No. 9 and previous communications, I am impelled to change my vote from the affirmative to negative.

"I am inclined to think, however, that it would be better to reconsider the former motion. I would be glad to make this motion or second the motion that any other one should make, asking for a reconsideration.

"I am sorry, however, that this reversal of the vote, in view of what has already been done, puts us in a rather embarrassing position, but through no fault of the Council."

By "former motion," Professor Sayre probably refers to Motion No. 12 (C. L. No.

6) on invitation to Canadian Pharmaceutical Association, which motion, while it received a majority of affirmative votes, can readily be reconsidered, if desired, as no notice of action has yet been sent to the Canadian Pharmaceutical Association.

Frank H. Freericks writes:—

"With reference to Motion No. 17, and your request for an expression, I would point out that I voted against extending an invitation to the Society of Japan, as also against extending such invitation to the Canadian Society. My reason for voting against such invitation was primarily based on the fact that when I as an individual extend an invitation, I mean to, and hope to have it accepted. Personally, I could not wish for the acceptance of our invitation by either Society, because it would only tend to further interfere with our own work at the San Francisco Convention, thus resulting to the disadvantage of our Association. It is this feature which controlled me entirely in voting No, on both Motions, however, I do not want to dismiss the subject without saying, that a spirit of neutrality owing to the War was also in my mind. People who are directly concerned in the War, are apt to have very strong and possible prejudiced opinions. It is altogether likely if the Canadian or Japanese Society should meet with us, that there would be at least an expression of personal opinion. Taking it for granted that such expression would be in keeping with the opinion which seems to prevail in Canada and no doubt in Japan, I personally would find it very difficult to avoid expressing a different opinion, for after all, speaking for myself I am only human, and have very strong convictions regarding the War which would be I am sure unpleasant for either men from Canada or Japan to hear. However, as stated, my vote was controlled primarily by the belief that such invitation if accepted would only add to our difficulties which of themselves are plenty in an Exposition City."

Motion No. 20 (*Tabling of Motion No.* 17.) Moved by J. B. Thomas, seconded by C. A. Mayo, that *Motion No.* 17 (*Extension of Invitation to Pharmaceutical Society of Japan to meet in San Francisco in* 1915) be tabled.

Motion No. 21 (*Applications for Membership.*) You are requested to vote on the following applications for membership:—

No. 52. Leonard Ellsworth Coolbaugh, In care McKinney's Pharmacy, Corsicana, Texas, rec. by Freeman P. Stroup and E. Fullerton Cook.

No. 53. Harry S. Harrison, 417 S. Clinton St., Baltimore, Md., rec. by H. A. B. Dunning and J. W. Westcott.

No. 54. Mrs. Anna L. Wiley, Hartville, Ohio, rec. by Anna G. Bagley and George B. Kauffman.

No. 55. Elmer A. Watson, Clayton, Ill., rec. by H. M. Whelpley and J. W. Mackelden.

No. 56. Jose Antonio Gonzalez Jones, P. O. Box 166, Barranquilla, Columbia, S. A., rec. by H. M. Whelpley and J. W. Mackelden.

No. 57. Mansfield B. Herald, 1027 Story St., Boone, Iowa, rec. by Zada M. Cooper and Wilber J. Teeters.

No. 58. Eduardo Garcia Faundo, Monte 497, Havana, Cuba, rec. by Jose P. Alacan and Jose Guillermo Diaz.

J. W. ENGLAND,
Secretary of the Council.

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COUNCIL LETTER NO. 12.

December 26, 1914.

To the Members of the Council:—

Motions No. 19 (*Approval of Budget of Appropriations for* 1915), *No.* 20 (*Tabling of Motion No.* 17), *No.* 21 (*Applications for Membership; Nos.* 52 *to* 58 *inclusive*) have each received a majority of affirmative votes.

The following communication (December 17) has been received from J. A. Koch, Chairman of the Finance Committee:—

"I believe that in order to avoid any chances of misinterpretation, paragraph 3, of Section 2, General Rules of Publication, page 35, Council Letter 11, should read:

"The procedure for the payment of such bills shall be as follows: (1) At the end of each month, the Editor shall send all paid-and-receipted bills and cancelled checks, with an itemized bill or statement, to the Chairman of the Committee on Publication for approval; (2) After approval, the Chairman of the Committee on Publication shall send the bills and checks to the General Secretary for payment in accordance with Article 2, Chapter 5, of the by-laws and Rule Third of the General Rules of Finance; and (3) The Treasurer shall send the Editor a check to cover the amount of the bills and thus increase the bank balance."

The change proposed involves no change in the intent of the rule, but simply clarifies its meaning. If there is no objection, the new paragraph will be substituted for the original paragraph.

The Detroit Branch, A. Ph. A. was organized on December 11, 1914. The following officers were elected: President, W. A. Hall; Vice-President, A. A. Wheeler; Secretary, Wilbur L. Scoville; Treasurer, C. F.

Mann; Council Representative, Leonard A. Seltzer.

At the meeting of the City of Washington Branch, A. Ph. A., held December 16, 1914, Samuel L. Hilton, 22nd and L Streets, N. W., Washington, D. C., was elected representative to the Council from the Branch for the years 1915, 1916 and 1917, succeeding Henry B. Floyd.

The following letter (December 15) has been received from Albert Schneider:—

"I am very much afraid that some of our good friends are making much ado about nothing. It strikes me that extending the invitations to our brothers across the sea is but a kindness which, so it appears to me, we owe them merely as a matter of special consideration and courtesy occasioned by the great San Francisco Exposition. You may rest assured that the Exposition Management are heartily in accord with us in the matter. We do not obligate ourselves further than to show our visitors such consideration and kindness as we are in position to offer. We are in no wise obligated financially. The Exposition Management will gladly grant meeting-hall privileges and the local druggists would no doubt join us in showing them some courtesy.

"I desire to state further, as prime mover in extending the invitation, that the motive was wholly neutral and impartial. In other words, the invitations were purely intellectual, based upon the consanguinity of common scientific interests, and entirely apart from any personal opinions and feelings regarding nationalities."

The following letter (December 23) has been received from F. T. Gordon:

"I have given a good deal of thought to the matter of inviting the Pharmaceutical Society of Japan to hold joint sessions with us at our San Francisco meeting and I am afraid that we have unwittingly stirred up the depths of international feelings. I lived in Japan for three years and know what a proud and sensitive people they are and that they keenly resent any patronage of superiority from us or any other nationality. I fear the matter has gone too far now, for copies of our Journal are doubtless in their hands by this time and our comments must cut deeply to the quick when read by the educated Japanese. The whole matter was a blunder, well meant as are all blunders, but hard on the victim. What the Association should have done, in my opinion, was to recognize no nation, no class, no creed, but that of pharmacists working for the welfare of all mankind to alleviate suffering and to make better men of those entrusted to our care. When the world is torn by war we are all brothers, not fighters.

Therefore, I make the following motion: That the American Pharmaceutical Association send, individually and collectively, its sincere appreciation of the unselfish work done by brother pharmacists of all nations in relieving the sufferings of war and of the sacrifices made, and that as Americans of every national descent we honor them and pray for their welfare and future peaceful prosperity. Also:—

That copies of this motion be sent to the appropriate officers of the pharmaceutical associations of the various nations as an expression of the sympathy and good will of their brother pharmacists in the United States and as a New Year's greeting, a new year of peace and prosperity for all. Also:—

That the President of the American Pharmaceutical Association be empowered to have suitable forms or letters made that will express this sentiment and forward them under his official title through the Secretary of the American Pharmaceutical Association."

Mr. Gordon's motion is seconded by J. W. England. Do you favor it? It will be regarded as *Motion No. 22 (Greetings to Pharmacists and Pharmaceutical Associations of other Nations.)*

Motion No. 23 (Approval of General Rules of Publication.) Moved by C. A. Mayo, seconded by Dr. F. E. Stewart, that the General Rules of Publication as set forth in Council Letter No. 11 be approved.

Motion No. 24 (Election of Local Secretary for 1915.) Moved by Dr. F. E. Stewart, seconded by F. T. Gordon, that Albert Schneider of San Francisco, be made local Secretary for 1915.

No action has been taken by the Council on the question of the proposed A. Ph. A. Exhibit at the Panama Pacific Exposition, and to dispose of the question, William R. White writes as follows:—

"In regard to the discussion of the question of the A. Ph. A. having an exhibit at the Exposition, will say that I think we are not able to finance such an undertaking and in view of the uncertainty of getting the assistance necessary from other sources, and in order to settle this question before the Council, I move that the Council disapprove of the effort being made to have an exhibit at the San Francisco Exposition."

The above motion is seconded by George M. Beringer, and will be regarded as *Motion No. 25 (Disapproval of Proposed Exhibit at the Panama-Pacific Exposition.)*

J. W. ENGLAND,
Secretary of the Council.

The Pharmacist and the Law

LIABILITY FOR BOTTLE EXPLOSION. PRIVITY OF CONTRACT.

In an action for injuries caused by the bursting of a soda-pop bottle, the defendants were engaged in manufacturing and selling soda-pop, and the plaintiff and her husband sold soft drinks. They bought from the defendants a case of their goods, and, after it was delivered, the plaintiff lifted one of the bottles from the case and was carrying it to the ice box when the bottle exploded, so injuring her eye that it had to be removed. The trial court directed a verdict for the defendants. On appeal it was held that there was sufficient privity between the plaintiff and the defendants for her to maintain an action for her injuries, though she was not a partner with her husband, and was merely acting under his direction. If, it was said, the vendor is to be held liable at all for his negligence in cases of this character, there is no reason for limiting that liability in favor of the vendee individually, who may never personally be exposed to the danger resulting from this negligence.

Actionable negligence, has been defined as a breach of duty resulting in injury to some person to whom that duty is legally owing, and the duty here was not merely to so charge a bottle as that its contents might not be wasted, but also to exercise that care which an ordinarily prudent person would use, to avoid the infliction of an injury which might reasonably be expected to follow the failure to use this care; and that duty was owing, not only to the vendee, but also to his employes, who performed the service which the parties must have contemplated as necessary to be performed when the sale was made.

The court cited the case of O'Neill v. James, 138 Mich. 367, 101, N. W. 828, 68 L. R. A. 342. 110 Am. St. Rep. 321, 5 Ann. Cas. 177, as one where the facts are strikingly similar to the facts in the present case, except that the party injured by the explosion of the bottle was an employe of the owner of the business, and there was no proof of knowledge upon the part of the defendant that the bottle which exploded had been improperly charged with the gas. In that case the plaintiff has recovered a substantial judgment, which was reversed on appeal because of the insufficiency of the evidence to sustain the allegations of the complaint. It was held that a manufacturer of champagne cider, which is ordinarily not dangerous, is a common article of commerce, and is manufactured by him by proper machinery, and not excessively charged, is not liable for injuries to an employe of his customer through the explosion of a bottle, unless he knows that for some reason such bottle is peculiarly liable to explode. The court distinguished that case from the present, because there was proof in the latter, tending to show that the bottle was improperly charged, and that the defendants were aware of that fact, or were at least in possession of such knowledge and information on that subject as would impute knowledge to them of that fact. The ordinary law of principal and agent would charge the defendants with any knowledge possessed by their employes who were actually engaged in charging the bottles.

The evidence presented no issue for submission to the jury upon the question of the use of defective bottles, as the proof showed the bottles were purchased from a manufacturer whose bottles were of standard grade and quality, and the only theory upon which a recovery could be sustained, was that the defendants were guilty of negligence in charging the bottle, and that this negligence was the proximate cause of the injury. On the ground that the latter issue should have been submitted to the jury, the judgment for the defendants was reversed.

Colyar v. Little Rock Bottling Works,
Arkansas Supreme Court, 100 S. W. 810.

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IMPLIED WARRANTY OF FITNESS FOR PURPOSE—KNOWLEDGE OF BUYER.

In an action for the purchase-price of a secret chemical preparation known as "dinamine" for killing grass and weeds, the defense was an implied warranty that one application was sufficient, whereas two applications were required. It was held that where a manufacturer sells an article for a particular purpose, so that the buyer necessarily trusts to his judgment, the law implies a promise that the article is reasonable, fit and proper for such purpose; but such implied

promise is conditioned and dependent upon the use of the article in the manner, quantity, and under the conditions prescribed by the manufacturer, and, when not so used, then such promise is not implied. It appeared that the defendant railway company's general manager had been informed before the contract was made that the seller claimed that two applications were necessary. It was held that there was no implied warranty that one application would suffice, and the fact that the defendant's other representatives, those to whose judgment and discretion the purchase of the "dinamine" was committed, did not have this information imparted to them by the general manager did not alter the situation. Evidence, therefore, that such representatives were not so informed, and would not have made the purchase had they known that two applications were necessary, was not material. Judgment for the plaintiff was affirmed.

Missouri, K. & T. Ry. Co. of Texas v. Interstate Chemical Co., Texas Civil Appeals, 169 S. W. 1120.

Changes of Address

All changes of address of members should be sent to the General Secretary promptly.

The Association will not be responsible for non-delivery of the Annual Volume or Year Book, or of the JOURNAL unless notice of change of address is received before shipment or mailing.

Both the old and the new address should be given, thus:

HENRY MILTON,
From 2342 Albion Place, St. Louis, Mo.
To 278 Dartmouth St., Boston, Mass.

Titles or degrees to be used in publications or in the official records should be given, and names should be *plainly* written, or typewritten.

<>

G. H. GOOSEY,
From Camp John Hay, Benguet, P. I.,
To Segt. 1st Cl. H. C. Post Hosp., Ft Meade, So. Dak.

H. C. NEWTON,
From Southboro, Mass.,
To care Creighton College of Pharmacy Omaha, Neb.

H. G. POSEY,
From Peniston St., New Orleans, La.,
To Cor. Hurst & Webster Sts., New Orleans, La.

MRS. FANNIE SCHENK,
From Deer Trail, Colo.,
To 1321 Broadway, Denver, Colo.

W. D. BOST,
From 6015 a Hortay Pl., St. Louis, Mo.,
To 50-60 First St., San Francisco, Cal.

J. D. GLANCY,
From West Upton, Mass.,
To 59 Gates Ave., Brooklyn, N. Y.

C. C. YOUNG,
From 735 Church St., Nashville, Tenn.,
To Residence unknown.

CHAS. A. BILLUPS,
From Jefferson Barracks, Mo.,
To Residence unknown.

J. C. LIEBER,
From Houston, Texas,
To Fort Sam Houston, Texas.

C. M. DODSON,
From 418 So. Washington, Enid, Okla.,
To Residence unknown.

K. C. ROBBINS,
From Ft. Worth, Texas,
To Station A, No. 215 North Lancaster St., Dallas, Texas.

J. L. GERLACH,
From Ft. Terry, N. Y.,
To With U. S. Forces, Vera Cruz, Mexico

DAVID GOODMAN,
From Ft. Mills, Corrigedor, P. I.,
To Manila R. R. Co., Manila, P. I.

M. E. BELSON,
From Lott, Texas,
To Rosebud, Texas.

WM. H. LAMONT,
From Chicago, Ill.,
To 1205 Clara Ave., St. Louis, Mo.

EDWARD HOFFMAN,
From 4924 Fifth Ave., Brooklyn, N. Y.,
To 4422 Sixth Ave., Brooklyn, N. Y.

F. B. POWER,
From London, England,
To 535 Warren St., Hudson, N. Y.

E. H. HESSLER,
From 145 No. 10th St., Philadelphia, Pa.,
To 309 So. 12th St., Philadelphia, Pa.

L. S. BRIGHAM,
From 1 Gordon St., Savannah, Ga.,
To 20 East Henry St., Savannah, Ga.

G. S. LOHMAN,
From St. Louis, Mo.,
To 2043 Alice Pl., St. Louis, Mo., care Johnson Bros.

JOHN BEST,
From 1 German Block, Central City, Colo.,
To Residence unknown.

J. K. MEHRTENS,
From 5251 11th Ave., San Francisco, Cal.,
To Food & Drug State Laboratory, Berkeley, Cal.

CARL G. ANDERSON,
From 2016 Cleveland Ave., Chicago, Ill.,
To 901 Wells St., Chicago, Ill.

H. A. R. KROGER,
From Camp Downes, Manila, P. I.
To Residence unknown.

MAX RISENBERG,
From Camp Connell, Samar, P. I.
To Walter Reed General Hospital, Tacoma Park, D. C.

HARRY COOK,
From Pettit Barracks, Zamboango, Mindanao, P. I.
To Residence unknown.

M. J. NOLL,
From 5571 Vernon Ave., St. Louis, Mo.
To 11 So. Fourth St., care Eli Lilly, St. Louis, Mo.

CHAS. H. ROGERS,
From care Pharm. Dept., Univ. of Minn., Minneapolis, Minn.
To W. Va. Univ., Morgantown, W. Va.

JEANNOT HOSTMANN,
From 1122 Hudson St., Hoboken, N. J.
To 1208 Hudson St., Hoboken, N. J.

HOWARD W. GARDNER,
From 517 Monroe St., Brooklyn N. Y.
To 1547 Capouse Ave., Scranton, Pa.

M. K. BERKOWITZ,
From U. S. Marine Hosp., Cairo, Ill.
To U. S. Quarantine Station, Pensacola, Fla.

C. V. NICHOLS,
From 408 East Main St., Anadarko, Okla.
To 1005 Lincoln Ave., Ann Arbor, Mich.

JUSTIN S. BREWER,
From 2532 Third Ave. S., Minneapolis, Minn.
To 2113-29 Franklin Ave., St. Louis Mo.

DECEASED SINCE OCT. 18, 1914.

W. H. LACEY, Philadelphia, Pa.

DECEASED SINCE NOVEMBER 18, 1914.

GEORGE W. BOYD, Washington, D. C.

REINSTATED.

ALBERT M. TODD, 204 N. Rose St., Kalamazoo, Mich.

OIL OF PEPPERMINT.

Weather conditions during the early spring and throughout the summer were extremely favorable, and a thorough canvass made by our representative in producing districts early in June showed an increase of over 3,600 acres over the acreage of 1913.

Throughout the season the peppermint plants looked very promising, and the distilling was begun as early as the latter part of June, which is quite unusual. It furthermore developed that the yield was exceptionally large and averaged at least 30 pounds of oil per acre, generally more, and, in consequence, a production of between 550,000 and 600,000 pounds of oil has to be reckoned with this year, while the annual consumption is estimated to amount to about one-half of this quantity.

Stocks of old oil were nearly exhausted before the new crop could be marketed, and during the months of May and June the high price of $4.25 per lb. was reached. As soon as the new oil was available a rapid decline took place, until the present values prevailed.

The export demand, on account of the European war, being very small only, and, on account of business conditions in general, it would not be surprising if the declining tendency which has so far prevailed would continue, and unless next year's crop should prove to be an entire failure, it is reasonable to assume that peppermint oil may be bought at moderate figures for some time to come.

Since the high prices which prevailed during the last few years enabled the farmers to take better care of their fields, the quality of this year's oil was generally found to be excellent.—*From Advance Circular, Fritzsche Brothers.*